NEW ZEALAND JOURNAL OF Agriculture

SEPTEMBER - 1957

COMMONWEALTH MYCOLOGICAL INSTITUTE
30 OCT 1957

How to buy

FIVE ACRES FOR A FIVER!

WEEDONE
'57'
NON-VOLATILE
WEEDONE
'57'
VOLATILE
PASTURES

Pasture land left to greedy weeds soon loses its carrying capacity. Buying it back economically is the job for Weedone. Take Buttercup. One gallon of Weedone '57' (creeping and celery leaved) or Weedar M.C.P.4 (giant) costing less than £5 to spray, controls five acres of buttercup and allows lush green stock-fattening grasses and clovers to come away. You get similar economy with thistles, ragwort, docks (Weedone PEG) and most other pasture weeds. That's because Weedone varies its 2, 4-D formulations to break down the resistance of practically every weed type. In terms of extra profit gained, Weedone control is a real bargain!

WEEDONE

WEEDONE SERVICE
REGD. TRADE MARK

Genuine Weedone Products are recognised by this distinctive sign. Make sure you get genuine Weedone from your Weedone Service Distributor.

PRODUCTS OF IVON WATKINS LTD.
Home of the Weedone Service

Volume 95

Number 3

16 September

1957

(Established 1910)

NEW ZEALAND JOURNAL OF Agriculture

Published by

Direction

of

Rt. Hon. K. J. Holyoake,

Minister of Agriculture

This Month's Cover

Soil erosion is not as serious in New Zealand as in other countries that have been farmed longer, but there are places and circumstances in New Zealand where erosion problems have arisen and where they could become more serious if correct land use is not adopted at once. The Soil Conservation Service, now incorporated in the Department of Agriculture, offers, through this Department and Catchment Boards, technical assistance and subsidies to aid the re-establishment of degenerated country. This month's cover shows pasture furrowing on rolling North Canterbury country to reduce wasteful run-off. Photograph by National Publicity Studios.

New Zealand Department of Agriculture

HEAD OFFICE:
Dominion Farmers' Institute Building,
Featherston Street, Wellington

DIRECTOR-GENERAL:
E. J. Fawcett

DEPUTY DIRECTOR-GENERAL:
R. B. Tennent

ASSISTANT DIRECTOR-GENERAL:
P. W. Smallfield

DIVISIONAL DIRECTORS:

Animal Industry	J. E. McIlwaine
Animal Research	J. F. Filmer
Dairy	H. A. Foy
Extension	J. W. Woodcock
Horticulture	A. M. W. Greig

Editor: G. J. Neale

TABLE OF CONTENTS

Molybdenum Poisoning in Cattle on Pumice Land and Its Control by Injection of Copper	I. J. Cunningham	218
Water Harvesting	P. B. Lynch	223
Show Dates		224
Domestic Beekeeping	A. W. Bennett	225
Defects in Cream Flavour Caused by Addition of Water	M. J. McFetridge	226
The Dangers of Fodder Beet for Cattle and Sheep	V. J. Williams and M. R. Coup	227
Outdoor Cages for Household Laying Birds	P. Josland	231
Land Development on a Northland Problem Soil	R. G. Warren	233
Prevent Child Drownings with Covers for Sheep Dips		235
Central Otago—A Changing Grassland Scene	S. H. Saxby	238
No Benefit from Subsurface Placement of Phosphatic Fertilisers in Pasture	J. Karlovsky	245
Care of Livestock during October		246
Crop and Pasture Management (Seasonal Notes)		247
Infectious Laryngotracheitis of Poultry	R. M. Salisbury	249
Farm Building Construction	H. W. T. Eggers	251
Crops for Winter Feeding of Pigs	I. H. Owtram	259
Recent Research Work: Phosphate Trials at Invermay	R. S. Scott	263
The Home Garden	A. G. Kennelly	264
Meteorological Records for July		272
Conservation Farming in Central Otago Restores Badly Eroded Cropland	G. G. Calder	273
Probable Effects of Manuka Blight on Beekeeping in North Auckland	D. Roberts	279
Radio Broadcasts for Farmers		282
Overdrilling Pumice Pastures	G. S. Robinson and M. W. Cross	283
Dairy Produce Graded for Export		288
Convenient Type of Pot Dip	G. L. Wickenden	289
Seed Production in New Zealand: Chewings Fescue	W. Faithful	293
Renovation of Deteriorated Lawns	C. Walker	300
Rich Fruit Cakes	Maud B. Strain	301
The Flower Garden	K. H. Marcussen and Rosalie A. Campion	307
Folding Waste Basket	Eleanor S. Campbell	317
Child's Seamless Classic Cardigan		319

SUBSCRIPTION RATES

The "Journal" is issued monthly. The subscription within New Zealand is 10s. a year; the overseas subscription is 13s. (sterling). The "Journal" may be ordered from any bookseller or newsagent or direct from any office of the Department of Agriculture. Individual copies are available from Publications Section, P.O. Box 2298, Wellington, at 1s. a copy, post free.

Subscribers' inquiries (preferably accompanied by the address cut from a recent "Journal" wrapper) should be sent to the nearest office of the Department of Agriculture.

COPYRIGHT PROVISIONS

Articles in "The Journal of Agriculture" are copyright, but may be reprinted **provided both the "Journal" and author are acknowledged and the articles are not associated with advertising material.**

The Minister of Agriculture does not accept responsibility for any of the private and trade advertisements included in this publication.

All correspondence relating to the "Journal" should be addressed to the Editor, "The New Zealand Journal of Agriculture", P.O. Box 2298, Wellington

REGISTERED AT THE G.P.O., WELLINGTON, AS A MAGAZINE.

Molybdenum Poisoning in Cattle on Pumice Land and Its Control by Injection of Copper

By I. J. CUNNINGHAM,
Superintendent, Department of Agriculture Animal Research Station, Wallaceville

COPPER deficiency in beef animals has been evident in some areas in New Zealand in greying of the coats of Aberdeen Angus cattle and unthriftiness. The condition can be prevented by increasing copper supplies to the animals, and effective and cheap control of the disease has been achieved by a method of subcutaneous injection of copper compounds arising from research into the disease by the Wallaceville Animal Research Station. Copper cerates for treating animals can now be bought and farmers can get advice on their use from veterinarians or Livestock Instructors.

ABERDEEN ANGUS yearlings which graze over some of the pumice hills near Wairoa do not have the deep black coats characteristic of their breed. The black is replaced to a varying degree by grey. In slightly affected animals the grey occurs only round the eyes, like a spectacle frame; in more severe cases much of the coat is mottled grey-black; and in very severe cases the whole coat is grey and has a dull, lifeless look. The severely affected animals are undersized and unthrifty, but the less severely affected ones do not show any marked failure of growth or lack of thrift.

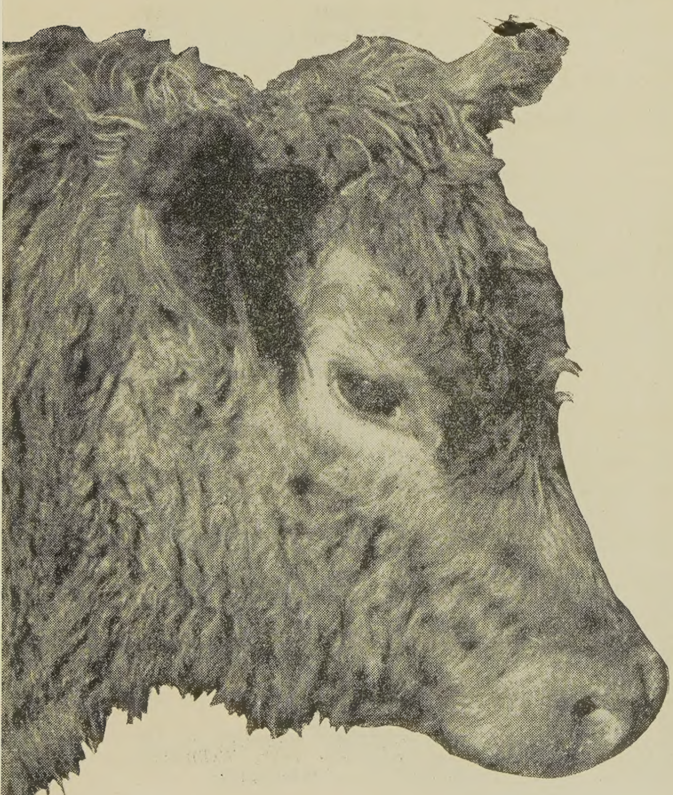
The disease is of most importance in weaners, for calves under 3 months of age and most animals over 18 months seldom show any signs. Some of the breeding cows, presumably among those who have borne a calf regularly each year, show greying, but not many lose condition. The main economic loss is therefore from the effect on weaners and comes chiefly through reduction in selling price of stunted animals and from occasional deaths, especially in the winter after weaning. The incidence of the disease varies from year to year. In some years only an odd weaner is affected and in others 25 per cent. or more are so poor that they are drafted and sold as culls; the remaining animals are below desired size.

The condition is associated with a slight deficiency of copper and an excess of molybdenum in the fodder which together have the effect of producing a copper deficiency in the animals. Table 1, on page 219, shows the pasture composition from one property where greying occurs and shows also the copper contents of livers and of blood samples taken from a random selection of animals on that property. It will be seen that the pasture is much higher than normal in molybdenum and that the livers and some of the blood samples are much lower than normal in copper content.

Method of Supplying Copper

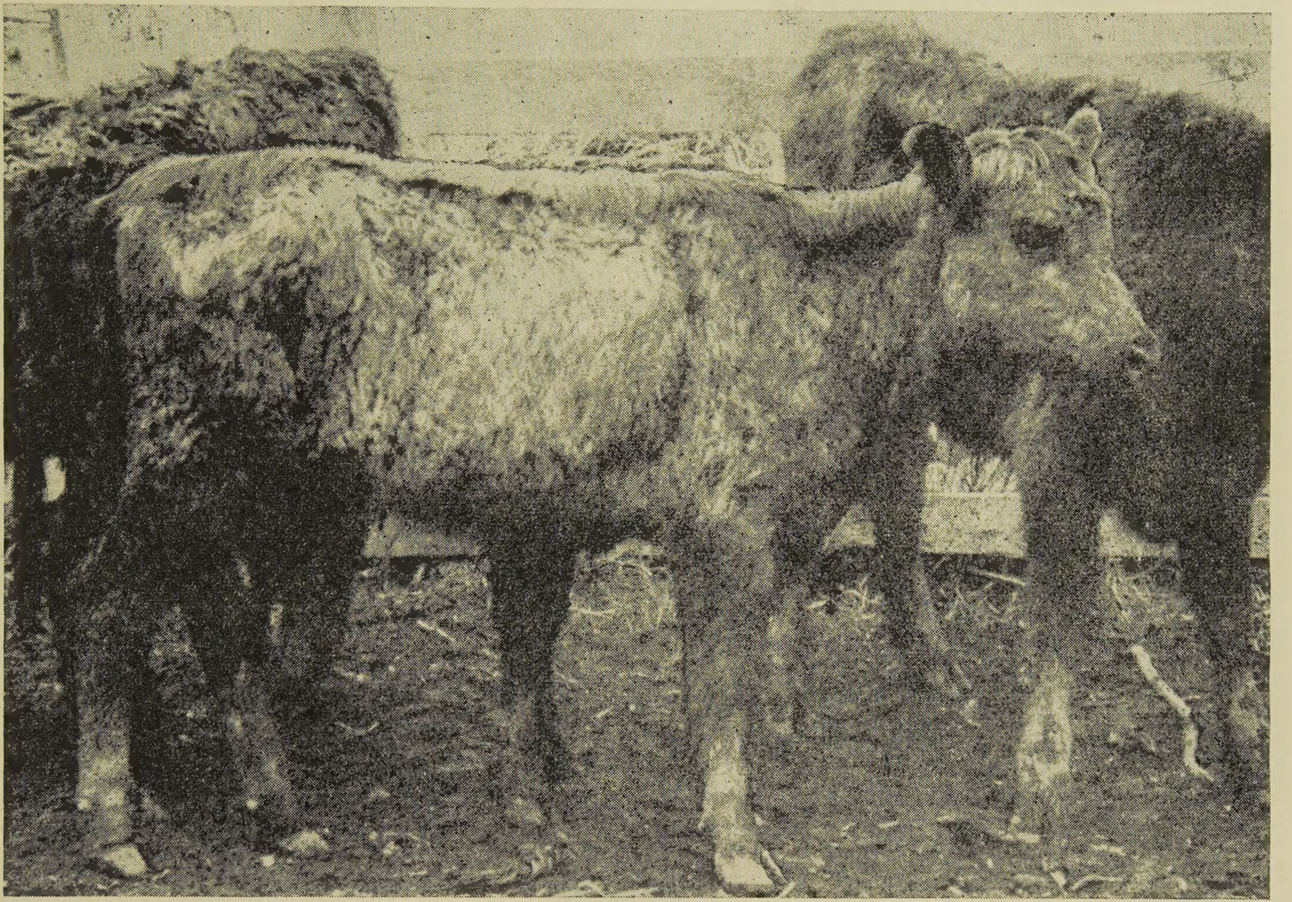
The greying and unthriftiness can be prevented by increasing the copper supplies of the cattle, but the way to do this economically was at first something of an enigma. Topdressing the pasture with copper salts would have been satisfactory except for the cost. Both sheep and cattle are carried on affected farms, but the sheep do not need extra copper and any financial return for the outlay on topdressing would come only from improvement in the cattle. As might be expected, sheep are in the majority and cattle are carried in low concentrations. For instance, on one farm of 300 acres there are 200 breeding cows, and it is the progeny of these 200 cows

▼ Slightly affected animals show grey round the eyes.



▼ Normal animal.

CONTROL OF MOLYBDENUM POISONING BY INJECTION OF COPPER



Severely affected animals are undersized and unthrifty and the whole coat is grey and has a lifeless look.

that would have to return the full cost of topdressing. The cost per animal that could be benefited would therefore be uneconomically high.

Licks could supply the necessary copper, but would also be expensive and would have to be put out in such a way that they were inaccessible to sheep, because a lick with sufficient copper to benefit the cattle would be dangerous for sheep.

Since neither topdressing of pastures nor provision of licks was likely to prove suitable, the possibility of control by direct treatment of animals was considered. Effective and cheap control of the disease was finally achieved by supplying copper through the injection of copper compounds.

After a number of trials, which ranged from intravenous injection of bluestone to subcutaneous placing of copper wire, the form of copper finally used was a compound known as copper glycinate, which is a blue powder containing 30 per cent. of copper. For injection into cattle the powder is suspended in a mixture of neat's-foot oil and marrow fat or of beeswax in peanut oil and the suspension, known as copper glycinate cerate, is dispensed in small, collapsible, single-dose tubes holding about 1 c.c. The tube and its contents can be sterilised by heat when first filled and stored in this sterile state until required for use. The dose is administered by squeezing it through a hypodermic needle placed to deliver either subcutaneously or intramuscularly.

TABLE I

	Affected areas	Normal
Pasture:		
Copper contents (parts per million in dry pasture)	7.3 7.0	10.0
Molybdenum content (parts per million in dry pasture)	17.5 19.6	1.5
Liver:		
Copper contents (parts per million in dry liver)	5.0 (adult steer) 7.7 (adult cow) 11.9 (adult steer)	150
Blood:		
Copper content (milligrams per 100 millilitres of blood)	Average 0.04 (45 animals 7-9 months old)	0.09
	Range 0.016-0.064	—
	Average 0.05 (36 animals 12-15 months old)	0.09
	Range 0.030-0.080	—

Dose

A suitable dose of copper glycinate was decided on in the following way: Measurements were first made of the proportion of the injected copper which reaches the liver. From this information, a dose was selected which would deposit in the liver about the same amount of copper as is found in normal animals. Finally the selected dose was tried in the field to learn whether it would protect susceptible animals against greying.

To measure what proportion of the dose of copper gets into the liver it is necessary to know the weight of the liver and the concentration of copper in the liver before dosing and several

5 STAR RATING

1. EMPIRE Universal Ringless Inflations fit and protect all standard cups.

2. EMPIRE Universal Ringless Inflations. No internal mouthpiece, definitely more hygienic.

3. EMPIRE Crack Proof Tubings—soft, flexible, longer lasting.

4. EMPIRE Claw tubes—stand up to more than a full season's wear.

5. EMPIRE products live up to the maker's claims. Empire service department and testing laboratory are at your disposal.

for Empire

Rubber Mills Ltd. Woolston Christchurch
Distributors: Cotton Bros. Ltd.—All Centres.

Successful sheep farmers drench for stomach and intestinal worms with —

DALGETY'S LIQUID PHENOTHIAZINE

BECAUSE

(1) It is ready mixed
(2) Stays in suspension
(3) Does not cake
(4) Gives even doses
(5) One stirring lasts all day
(6) Can be used with any standard gun or pistolet.

Also available in TABLETS OR POWDER from any branch of —

Dalgety
AND COMPANY LIMITED
(Incorporated in England)

★ ★

Tomoana

DAIRY RATION

— still the best value food for Dairy stock

★ ★

weeks afterward. The weight of the liver can be measured after slaughtering the animal at the end of an experiment or can be calculated with sufficient accuracy from the body-weight. The concentration of copper in the liver can be measured at any time by analysing small pieces removed surgically.

Using these methods it was found that 400 mg. of copper glycinate is a satisfactory dose for cattle. This dose of glycinate contains 120 mg. of copper and of this about 100 mg. reaches the liver 2 to 4 weeks after dosing. That quantity will raise the concentration of copper by about 100 parts per million of dry liver and bring the level to that found in normal, healthy animals.

For tests on the control of greying made under practical farming conditions 400 mg. of copper glycinate was the dose finally decided on.

Times of Dosing

The times at which doses should be administered had also to be decided. Access to run calves is governed to a large extent by the problem of mustering, but there are at least two essential musters on any station, one for marking and one for weaning. The suitability of these two muster periods for preventive injections was therefore studied by treating some animals and comparing their progress with that of untreated animals in the same herd. This comparison in the same herd was made possible by treating heifer calves and leaving steers untreated. The effectiveness of a treatment was measured by its success in bringing animals through to 15 months of age in a thrifty condition without greying of the coat.

It was found that young calves, 2 to 3 months old, could safely be injected with 400 mg. of the cerate at marking time in November. By the next (weaning) muster in the following May treated animals were found to be in better condition than the untreated ones. In some years there were a few treated heifers showing grey round the eyes and in other years some even showed a mottled coat, but stunted and severely greyed animals did not occur. Among untreated steers on the other hand there were in some years as many as 25 per cent. which showed severe greying at weaning.

TABLE 2—AVERAGE BLOOD COPPER IN TREATED HEIFERS AND UNTREATED STEERS

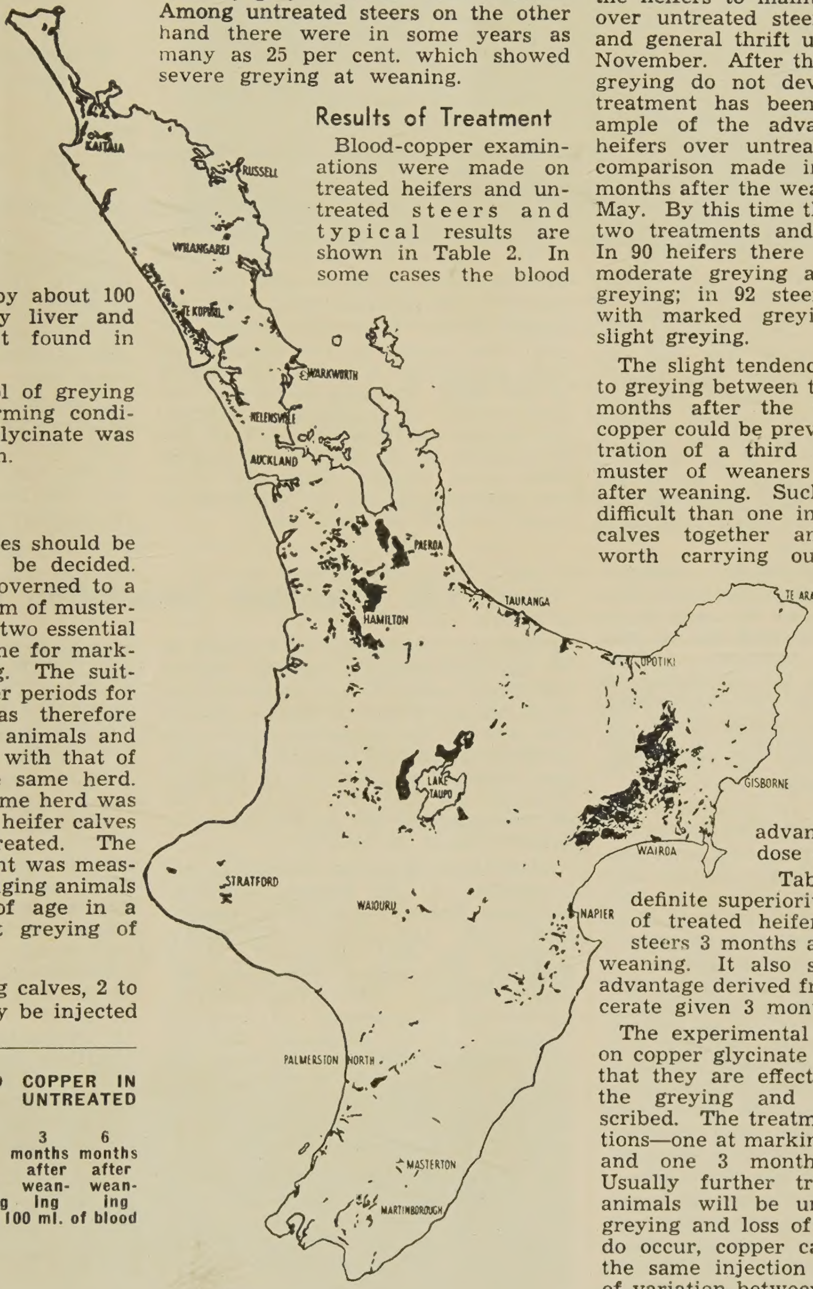
	Weaning	3 months after weaning	6 months after weaning
	Mg. per 100 ml. of blood		
1955:			
Heifers treated at marking and weaning	0.052		
Steers untreated ..	0.040		
1956:			
Heifers treated at marking and weaning only	0.039	0.083	0.065
Heifers treated at marking, weaning, and 3 months after	0.039	0.085	0.083
Steers untreated ..	0.048	0.055	0.050

Results of Treatment

Blood-copper examinations were made on treated heifers and untreated steers and typical results are shown in Table 2. In some cases the blood copper of heifers was as low as that of steers at weaning time. This indicated that the dosing rate was borderline and suggested that an additional dose of cerate between marking and weaning would have been an advantage. In the several years of observations heifers treated at marking were in good condition at weaning despite low blood copper, and there was therefore no justification for the expense of an extra muster between marking and weaning.

A second dose to the heifers given at the weaning muster in May enabled the heifers to maintain an advantage over untreated steers in coat colour and general thrift until the following November. After this further cases of greying do not develop, even if no treatment has been given. An example of the advantage to treated heifers over untreated steers is the comparison made in August 1955, 3 months after the weaning treatment in May. By this time the heifers had had two treatments and the steers none. In 90 heifers there was one showing moderate greying and 9 with slight greying; in 92 steers there were 21 with marked greying and 22 with slight greying.

The slight tendency in some heifers to greying between the third and sixth months after the weaning dose of copper could be prevented by administration of a third dose at a special muster of weaners made 3 months after weaning. Such a muster is less difficult than one involving cows and calves together and is considered worth carrying out to obtain the advantage of the extra dose of copper.



← The black areas are the soils listed in Table 3, where high-molybdenum pastures occur.

Table 2 shows the definite superiority in blood copper of treated heifers over untreated steers 3 months and 6 months after weaning. It also shows the further advantage derived from a third dose of cerate given 3 months after weaning.

The experimental work carried out on copper glycinate cerates has shown that they are effective for control of the greying and unthriftiness described. The treatment is three injections—one at marking, one at weaning, and one 3 months after weaning. Usually further treatment of older animals will be unnecessary, but if greying and loss of condition in cows do occur, copper can be supplied by the same injection method. Because of variation between years and farms, it is not possible to lay down any rule for treatment of adult animals. A cerate should be injected if there are signs of greying or loss of condition.

Injection Procedure

Injection in the beef animal is best made subcutaneously. With intramuscular injection there is a risk that an abscess could form and remain undetected right up to the time of use of the meat. Even though such abscesses are very rare, the risk of loss of the prestige of the meat is one that should be avoided. Slight blemishes are sometimes left after subcutaneous injection, but these are less important, for they can be seen and trimmed off.

On farms where blackleg occurs there is a slight risk that an injection could carry spores of blackleg with dust from the skin and cause blackleg in the calf. Where blackleg has been known to occur injections should not be made unless calves have been vaccinated at least 2 weeks previously with blackleg vaccine.

Copper cerates have also proved to be convenient and suitable for sheep. The dose for sheep, arrived at in the same way as for cattle, is 150 mg. of copper glycinate, which provides 45 mg. of copper. With this dose the concentration of copper in a sheep's liver is increased by about 300 parts per million, which ensures enough copper for at least 12 months, even if the sheep is living on a diet which is very deficient in copper. Sheep are susceptible to poisoning by copper, and a cerate containing a cattle dose could poison a small sheep.

Since copper cerates are a satisfactory source of copper for both cattle and sheep, they can be used as an alternative to other methods for controlling copper deficiency. Their special value is for treatment of animals on areas where conventional methods of supplying copper are too expensive. The instance of molybdenum-rich pastures has been discussed in this article.

Where Disease May Occur

There are fairly large areas in New Zealand which produce pastures high in molybdenum and a list of the soils on which they grow is given in Table 3 with the approximate area of each soil where this is known. Disease in cattle controllable by supplying copper has been diagnosed on farms situated on those soils marked by an asterisk. The symptoms vary for different soils. For example, on peat soils the whole herd may be affected with acute spring scouring, while on Tuai coarse sand between Wairoa and Lake Waikaremoana the main problem is the greying of weaners already described.

The similarity of the chemical composition of pastures from the soils listed in Table 3 suggests the strong possibility that disease controllable by supplying copper could occur on any farm situated on any one of the soils. It is, indeed, likely that such diseases already occur but have been overlooked because they might not recur every year and because the unthriftiness, the greying, or the scouring have not been recognised as signs of a disease.

TABLE 3—COPPER AND MOLYBDENUM CONTENT OF SOILS WHICH PRODUCE PASTURES HIGH IN MOLYBDENUM

	Average content Copper	Average content Molybdenum	Approximate area
	parts per million	parts per million	acres
NORTH ISLAND			
*Rotomahana sandy loam	8.0	6.5	4,500
*Peat soils	6.9	11.7	300,000
Tukituki set	10.4	5.2	93,000
*Opiki complex	11.8	5.5	17,000
*Konoti clay loam, hill soils	8.5	5.7	23,000
*Tuai coarse sands	8.0	7.8	200,000
*Tihoi-Opa complex	7.1	6.1	36,000
*Tihoi sand	5.1	4.6	
Maramaru coarse sands	8.0	5.5	10,000
Taumarunui sandy silt, hill soils	10.7	8.0	8,000
Matawai sandy loam	9.5	8.3	19,000
*Ahuriri soils	8.0	7.9	8,000
Waihua stony sandy loam	7.9	8.7	78,000
SOUTH ISLAND			
*Motukarara sandy loam, weakly saline phase	7.0	3.0	
Omihi silt loam	6.3	4.4	
*Weka sandy loam	3.9	4.5	

* Disease in cattle controllable by supplying copper diagnosed on farms on these soils.

The situation now is changed. It is known that when these signs occur in cattle it is probable that they are caused by too much molybdenum and too little copper in the fodder, and that probability is very high indeed if the cattle are kept on any of the soils named. It is advisable therefore for farmers on these soils to keep this probability in mind when inspecting their stock. Copper cerates are effective and economical for treatment of single animals or whole herds.

The locations of the North Island soils in Table 3 are shown as black areas on the map on page 221. No map of the South Island soils is yet available, so these cannot be shown in the same way. The map is not on a big enough scale to show whether any particular farm is situated on one of the soils, but it does allow some estimate of that possibility to be made. A talk with the Instructor in Agriculture for the district will settle the question.

N.Z. Grassland Association Conference

THE first conference to be held in the new Ruakura Farmers' Hall at the Department of Agriculture's Ruakura Animal Research Station, Hamilton, will be the nineteenth conference of the New Zealand Grassland Association from 15 October to 17 October. Between 500 and 600 people are expected to attend the conference. The programme is as follows:—

15 October: Opening address by the president, S. H. Saxby, Assistant Director, Extension Division, Department of Agriculture, Wellington. "Aspects of Soil Moisture", D. S. Rickard, Winchmore Irrigation Research Station. "The Water Requirements and Management of Irrigated Pastures", H. G. Hopewell, Rukuhia Soil Research Station. "Mechanics of Spray Irrigation", B. R. Homersham, engineer, Christchurch. "Economics of Spray Irrigation", J. M. Miller, Department of Agriculture, Hamilton.

16 October: "Results of Survey of Use of Short-rotation Ryegrass", R. H. Scott, Department of Agriculture, Wellington. "The Use of Short-rotation Ryegrass on a Bay of Plenty Farm", H. T. Titterton, Bay of Plenty farmer. "The Use of Short-rotation Ryegrass at Lincoln College", C. E. Iversen, Canterbury Agricultural College. "The Use of Short-rotation Ryegrass on a Manawatu Fat Lamb Farm", D. R. Willis, Greatford farmer.

In the afternoon there will be a field trip to the irrigation experimental area at Rukuhia Soil Research Station and to Ruakura Animal Research Station. The annual meeting of the association will be held at the Winter Garden, Anglesea Street, Hamilton, in the evening.

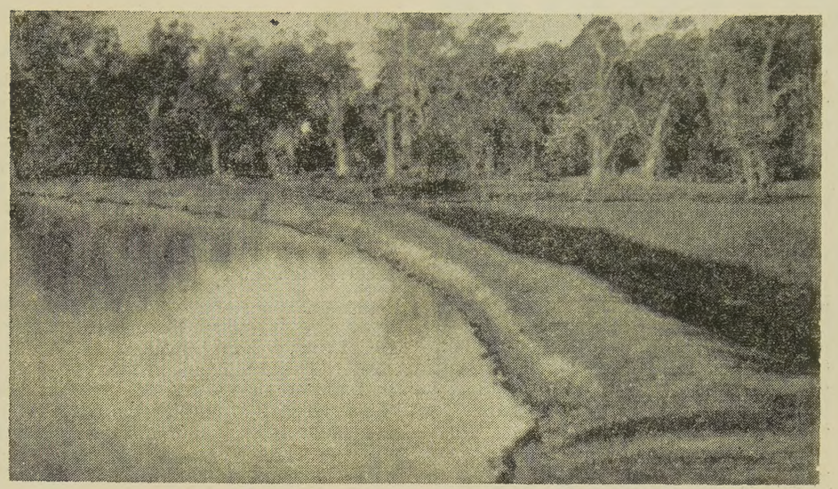
17 October: "Investigations with *Lotus* Species", P. C. Barclay, Grasslands Division, Department of Scientific and Industrial Research, Palmerston North. "The Influence of Treading on Pastures", D. Edmond, Grasslands Division, Department of Scientific and Industrial Research, Palmerston North. "The Use of Chemicals to Aid Crop and Pasture Establishment", L. J. Matthews, Department of Agriculture, Wellington. "A Discussion on the Rates of Grass Seeding and Manuring of New Pastures Sown Down under Varying Conditions of Soil Fertility and Farm Management", A. V. Allo and B. T. Jordan, Department of Agriculture, Tauranga. "Establishing and Maintaining Swards on Airstrips on Farms in Auckland Province", E. H. Arnold, Department of Agriculture, Auckland. "Some Factors that Influence the Rate of Growth of Pastures", R. W. Brougham, Grasslands Division, Department of Scientific and Industrial Research, Palmerston North. "Sulphur Responses on Pastures", T. W. Walker, Canterbury Agricultural College. "Some Aspects of Germination Analysis", A. V. Lithgow, Seed-testing Station, Department of Agriculture, Palmerston North.

Water Harvesting

By P. B. LYNCH,

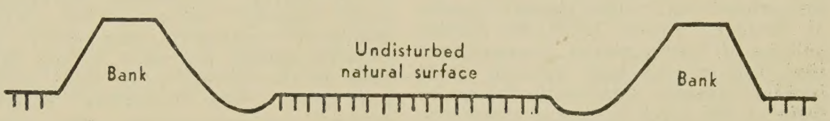
Crop Experimentalist, Department of Agriculture, Wellington

AT the McGarvie Smith Animal Husbandry Farm (University of Sydney), the officer in charge, Mr. H. J. Geddes, has developed a project which he terms "water harvesting". This is a method that could have wide application both in Australia and New Zealand in many districts where the seasonal distribution of rainfall is erratic and where droughts are a major factor limiting production. This article is based on data supplied by Mr. Geddes during an inspection of the farm by the author.



A "turkey nest tank" nearly filled at the McGarvie Smith Animal Husbandry Farm of the University of Sydney. The creek from which the water was pumped to fill the dam runs among the trees in the background.

Cross-section of a turkey nest tank.



THE animal husbandry farm at Badgery Creek is some 25 miles inland from Sydney and has an average yearly rainfall of 25in. However, the seasonal and yearly variation of this rainfall is very great. In 1954, for instance, there was a drought of 8 months. Normally two heavy falls of rain occur each year, but they may come at any time. Such erratic distribution of rainfall has meant that any temporary success with pasture improvement has been lost during dry spells, when the sward reverts to poor native species.

The soil type is a rather infertile heavy clay, derived from shale, which responds to phosphate and molybdenum. However, this type of soil, being rather impermeable to water, is ideal for the construction of water-holding dams.

It was clear in the early stages of this project that the key to improvement of the country was irrigation, but the difficulty was the supply of water. Bore water was far below the surface and was brackish. Two creeks on the property ran for only a few days during storms and then carried so much water that costly concrete weirs would be required to dam them.

Under these circumstances Mr. Geddes conceived the idea of using run-off water for irrigation. The first dam constructed had a capacity of 6 million gallons. It cost £A250, or £A11 5s. per acre-foot. Other dams have cost slightly more, but much depends on the natural contour of the country. Dams are constructed in natural catchments and are fed by surface run-off water from such catchments and by water collected from adjacent slopes by contour ditches. A series of dams is constructed at suitable sites down these catchments so that the overflow from each is collected by lower dams.

Water from a creek that runs about twice a year has been saved by so-called "turkey nest tanks". These are built on flat ground near the creek and are filled by water pumped from the creek when it is in flood. Each tank consists of a circular earth wall built above ground by spoil obtained from immediately within the tank. The centre is not disturbed. The diagram above shows the method of construction.

A clay subsoil is necessary for these tanks. The surface soil is removed both from the base of the bank and from the area used to form the bank. Clay is built on clay. The surface soil can be built to "face" the outside of the bank after construction. Shallow tanks store water cheaper than deep ones, but a certain minimum depth is needed. Mr. Geddes considers the minimum capacity to be 5 million gallons.

The larger these tanks are the cheaper is the cost of water storage. One of the dams at Badgery Creek holds 8½ million gallons of water for an excavation of only 8000 cubic yards.

Part of the animal husbandry farm, showing a dam which was recently constructed for harvesting water for irrigation. The only earthwork required was the bank in front of the trees.

Water is stored at a capital cost of about £A21 an acre-foot. Cost of filling the dam is 1s. worth of diesel fuel per acre-foot for every foot in height the water is lifted.

Necessary Conditions for Water Harvesting

Two essential requirements for water harvesting are (1) good water-holding soils and (2) suitable topography. Heavy clay subsoil is a great advantage in eliminating trouble from seepage and tunnelling, and gently undulating country is ideal in that a large storage of water is possible for each cubic yard of excavation. However, there is no doubt that sites for dams can be found under a variety of different conditions, though flat land is necessary for the turkey nest tank.

Evaporation from the dams has been much less serious than was at first thought. As the shallowest parts of the dams are used up first while irrigating, this reduces the water surface for evaporation. The storage system at Badgery Creek holds 48 million gallons of water, and it is considered that this would last through a 12 months' drought. Practically the entire farm of 400 acres is now drained into these dams, and about 200 acres are under irrigation. It would be safe to allow a storage of 1 million gallons for every 3 acres irrigated. In most of New Zealand, however, where droughts are less severe than at Badgery Creek, it is probable that 1 million gallons would irrigate a considerably greater area.

Irrigated Pastures

Irrigated pastures seen were dominantly white clover with some red clover, subterranean clover, and strawberry clover in the wetter parts. Growth was extremely vigorous. The grass (mostly short-rotation ryegrass) was rather sparse, but all pastures seen were young, and the oldest of these (3 years) was getting a better balance of grass to clover. Pastures were strip grazed with use of an electric fence.

On the 200 acres irrigated some 150 head of dairy stock were being carried, 60 of these being milked at the one time. The high proportion of young and dry stock is due to the fact that the herd size is being substantially increased. The farm supplied whole milk to Sydney, and a few cows were calved-down each month. About 70 sheep were carried in addition.

Pasture mixtures sown were generally 13lb. per acre, comprising 6lb. of short-rotation ryegrass, 2½lb. of white clover, 2lb. each of red clover and subterranean clover, and ½lb. of strawberry clover. Cocksfoot, paspalum, and timothy were under trial. Manurial treatment was 4cwt. of superphosphate per acre in the first year in two dressings of 2cwt. each, plus 2cwt. a year thereafter. Molybdenised superphosphate was used when sowing down to pasture and occasionally afterward, as the soil is somewhat responsive to molybdenum.

Methods of Irrigation

Sprinkler systems were used for irrigation, the water being pumped out of the storage dams nearest to the paddock being irrigated. The farm has 45 chains of spray lines and, with 60ft. moves, three men were kept busy irrigating much of the year. At present the usual rate of watering is 1in. every week, but it is intended to investigate various times, frequencies, and rates of irrigation.

It is considered that on a one-man farm 10 to 20 acres could be irrigated, and the labour requirements for this, though considerable, should be set against the fact that smaller amounts of conserved feed should be required.

Application in New Zealand

"Water harvesting" would seem worth while in much of New Zealand, particularly those districts with a rainfall of 30in. and under or where summer drought is frequent and serious. It offers a means of water conservation and reducing run-off which will interest all concerned with flood-control problems. Water for irrigation is obtained cheaply and costs of application are relatively low, as irrigated paddocks can be located close to the source of supply. If the paddocks are at a lower level than the water in the dams (as can frequently be arranged), pumping costs are lowered.

The huge capital costs of most irrigation schemes are eliminated and water may be made available in districts which such schemes cannot hope to service. Much of the foothill and downland country of Canterbury and Otago in particular would seem to be well suited to water harvesting. However, many problems remain to be solved before the method can be properly evaluated. Farmers would be wise to study the project carefully, and if their conditions appear suitable, to begin in a small way first, as no doubt modifications would be necessary in different districts and on different soils.

Agricultural and Pastoral Show Dates

THE following are dates and venues of A. and P. shows up to the end of December:—

NORTH ISLAND

October

*18 and 19 October—Poverty Bay A. and P. at Gisborne.
*22, 23, and 24 October—Hawke's Bay A. and P. (Royal Show) at Hastings.

November

31 October and 1 and 2 November—Waikato A. and P. at Hamilton.
1 and 2 November—Wairarapa and East Coast P. and A. at Carterton.
2 November—Tokoroa A. and P. at Tokoroa.
6 November—Waikato Central A. and P. at Cambridge.
8 and 9 November—Whangarei A. and P. at Whangarei.
*8 and 9 November—Manawatu and West Coast A. and P. at Palmerston North.
9 November—Clevedon A. and P. at Clevedon.
15 and 16 November—Wanganui A. and P. at Wanganui.
*16 November—Bay of Islands P. and I. at Waimate North.
16 November—Waihi A. and P. at Waihi.
22 and 23 November—Rotorua A. and P. at Rotorua.
22 and 23 November—Egmont A. and P. at Hawera.
28, 29, and 30 November—Auckland A. and P. at Auckland.

December

*7 December—Helensville A. and P. at Helensville.
7 December—Kaikohe A., P., and H. at Kaikohe.
7 December—Hauraki A. and P. at Paeroa.

SOUTH ISLAND

October

19 October—Ellesmere A. and P. at Leeston.
26 October—Northern A. and P. at Rangiora.

November

*1 and 2 November—Timaru A. and P. at Timaru.
2 November—Amberley A. and P. at Amberley.
7 November—Ashburton A. and P. at Ashburton.
8 and 9 November—Marlborough A. and P. at Blenheim.
*13, 14, and 15 November—Canterbury A. and P. at Christchurch.
16 November—West Otago A. and P. at Kelso.
20 November—North Otago A. and P. at Oamaru.
22 and 23 November—Nelson A. and P. at Richmond.
*23 November—Courtenay A. and P. at Kirwee.
23 November—Waimate A. and P. at Waimate.
23 November—South Otago A. and P. at Balclutha.
30 November—Motueka A. and P. at Motueka.

December

3 and 4 December—Gore A. and P. at Gore.
6 December—Wyndham A. and P. at Wyndham.
7 December—Otago Peninsula A. and P. at Portobello.
*10 and 11 December—Southland A. and P. at Invercargill.

* The Department of Agriculture exhibit will be staged at this show.

Main Wool Sales

The dates and venues of main wool sales until the end of January are:—

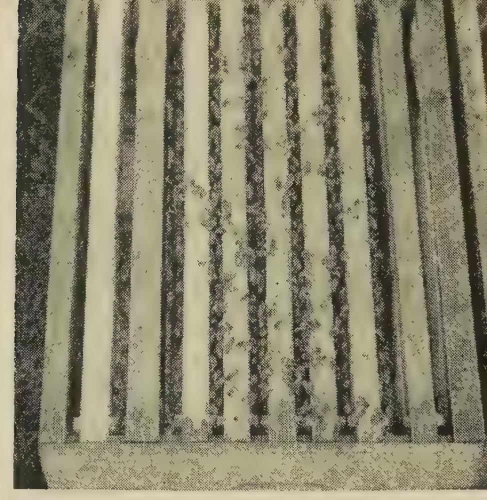
23 and 25 October: Dunedin.
30 October: Christchurch.
8 November: Auckland.
13 November: Wanganui.
18 and 20 November: Napier.
25 November: Wellington.
4 December: Christchurch.
9 December: Invercargill.
14 December: Dunedin.
18 December: Timaru.
10 January: Wanganui.
15 and 17 January: Auckland.
22 and 24 January: Napier.
29 and 31 January: Wellington.

◆

Increase of Colonies and Production of Honey

Seasonal Notes for the Domestic Beekeeper

AT this time of the year the beekeeper should have made up his mind whether he intends to manage his apiary solely for the production of honey or for a limited increase of colonies. In this article A. W. Bennett, Apiary Instructor, Department of Agriculture, Hamilton, describes the work to be done in both methods.



A hive in early spring, showing normal cluster of bees. There is shortage of stores in the outside combs, which should be replaced with full combs of honey or the hive fed with sugar syrup.

IF the bees were headed by a young, vigorous queen and a good supply of stores was left last autumn, by this time of the year brood rearing will have begun and hives should now contain some brood in all stages and begin to show an increase in the number of bees in the hive. Before this increase becomes too large a thorough inspection of the brood should be made. Any hive showing disease should be promptly destroyed by fire and the local Apiary Instructor informed of the action taken.

During this inspection a check can be made on the stores in the hive, and if they are low, feeding will have to begin and continue until the bees can gather enough food to maintain themselves.

After the inspection of the brood the hive can be given a spring cleaning. Floor boards should be scraped and any burr comb removed from the frames and boxes with the hive tool. If the inside of the hive is wet through the use of bad-fitting or worn-out equipment, sound, dry parts should be provided.

This spring cleaning of the hive is of immense help to the bees and the building up of the colony will greatly benefit by it. This work should be carried out as quickly as possible to avoid exposing the bees and brood too long to the cool air. An opened hive is also likely to attract robbers, and robbing at this time of the year can become quite serious.

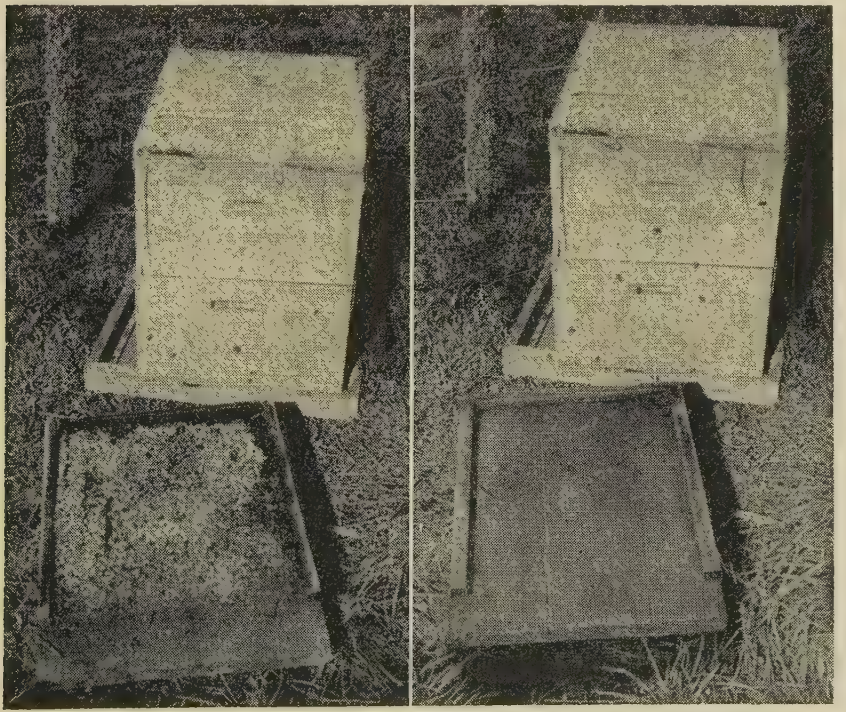
Making an Increase

For the domestic beekeeper still gaining experience with his bees it is perhaps best to increase slowly and be content with the doubling of the number of colonies kept; otherwise he may run into trouble through lack of experience and find he has lost money on his bees.

For each increase he intends to make he will require a floor board, 2 brood chambers complete with combs or frames of foundation, 1 mat, and a lid solely to house the brood of a new hive, plus any supers that may be required this season for the surplus honey. This equipment should be got ready now to receive the increase, as later in the season stocks may be low at the dealers and some items not procurable.

In 3 or 4 weeks the hives should be inspected again, and if a regular supply of food has been obtained by the bees during the last month, they will be quite strong and may be making preparations to swarm by building queen cells. At this stage the colony will be just right to make an increase.

The beekeeper must now go through the colony and find the queen. The



LEFT—Spring cleaning. Brood boxes are removed and placed on the upturned roof. The mat is left over the bees until the floor has been cleaned. RIGHT—The floor cleaned and ready to receive the boxes again. The hive should be kept in its original position.

Sound, well-painted equipment ready for use. Any parts that require changing during the spring clean should be replaced.

(Continued at foot of page 226)

Defects in Cream Flavour Caused by Addition of Water

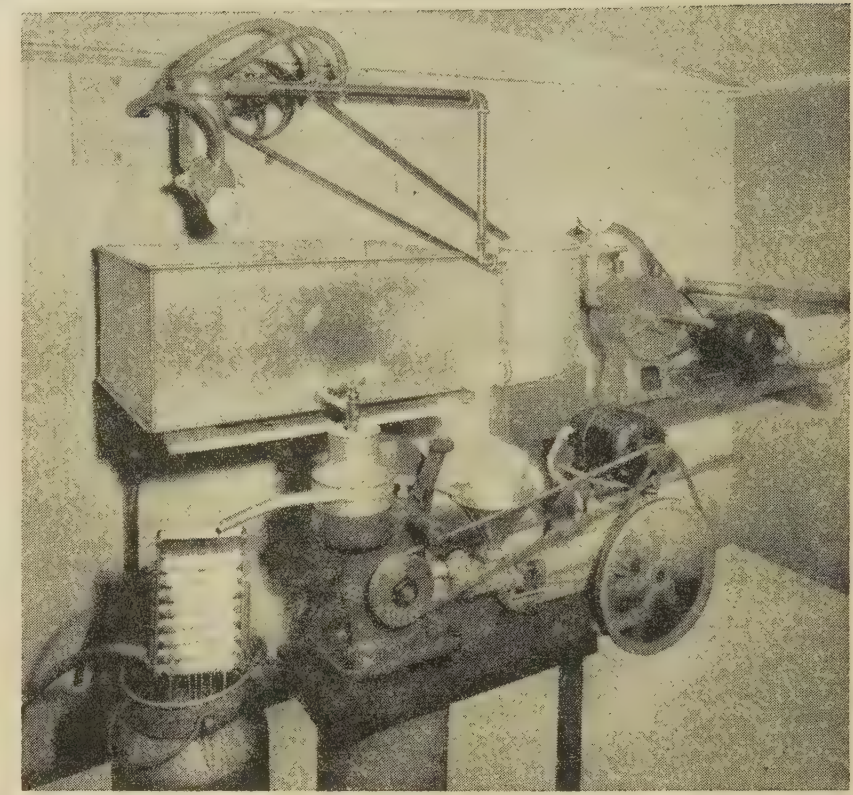
DAIRY factories receive from suppliers too much cream which is below finest grade and one of the main causes of flavours described as "flat and insipid" originates from extraneous water. This can be remedied to a large degree by the farmer if he takes reasonable precautions at the dairy.

SURPLUS water may reach the cream in the following ways:—

1. Flushing the machines before separation is completed.
2. Adding hot water directly to the vat to warm the milk before separation.
3. Using water to flush cream from the separator when all the milk has been separated.

The suggested remedy is:—

1. Water used for flushing the machine must **not** be run directly into the vat until separation is finished. If it is necessary to flush the milking machine before completion of separation, the water should be by-passed on to the floor or into a clean bucket.
2. Hot water must not be added directly to the cold milk for the purpose of warming it. If it is found necessary to warm the milk, hot water should be placed in a clean, thin-walled metal container such as a billy or similar receptacle stood in the vat while the milk is stirred.
3. Flush the separator with skimmed milk according to the size of the separator. Use about 2 gallons for a 100-gallon separator and run it through the separator from the vat. **Do not overload the separator by pouring the skimmed milk directly into the top cover or float chamber.** If water is used for flushing the separator, it must not be allowed to flow into the cream can.



[*Green and Hahn*

Cream Tests

The best test, both from the farmer's and the factory's point of view, is from 40 to 44 per cent. This gives a cream of good consistency which transports with the minimum of agitation. Cream which is below 40 per cent. is frequently churned during transport to the dairy factory, owing to its greater fluidity, and in such condition may be de-graded because of "flat" or "characterless" flavour.

—*M. J. McFETRIDGE,*

Supervisor of Farm Dairy Instruction, Department of Agriculture, Hamilton

---

Domestic Beekeeping

Continued from page 225

comb with bees and queen adhering is placed in a new hive alongside the old one. Next the old hive, now queenless, is removed to a new location and the new hive placed in the old position. In this hive are placed some of the combs of honey and empty combs, if any, from the old hive, the remaining space being filled with frames of foundation. This operation should be carried out during the daytime while a large number of bees are flying.

There will now be on the old stand a new hive containing one comb of brood with the queen and a few bees. To this will return all the flying bees and those away foraging for nectar or pollen at the time of the change-over. During the next couple of days all the older foraging bees from the old hive will also return to the new hive on the old stand, thus swelling the numbers of bees in the new hive to above that of a good swarm.

In the old hive at the new location, now queenless, there will be queen cells on several combs. These will have to be removed with the exception of one from which in a few days will hatch a virgin queen. This queen will mate and begin to lay eggs in about 8 to 10 days from hatching. The colony will still have quite a number of cells with brood from the old queen to hatch, so no great setback will be noticed in the old hive.

The old queen in the new hive will, of course, have carried on producing eggs, and as soon as 7 or 8 combs are filled with brood and there are enough bees to fill the first box, add another; at the same time lift a comb containing emerging brood up into this second box. This will encourage bees and queen to work in the new box.

With this system, which could be named "swarm control", and the adding of further supers as required by the bees for honey, swarming will be kept down to a minimum.

Production of Honey

The beekeeper wishing to produce honey without making an increase can work on exactly the same lines as described in the foregoing, but when the division is made the old hive should be kept close to the new one and when the young queen is laying, the old queen in the new hive can be found and killed. The two hives are then united by the newspaper method.

In 2 or 3 weeks this hive, which is now headed by the young queen, should be gone through and all brood and queen placed in the bottom two boxes and below an excluder if used. Other frames may be put in the super above ready for the honey flow. With the addition of extra room in the way of honey supers as required by the bees this hive will show little inclination to swarm this season.

The Dangers of Fodder Beet for Cattle and Sheep

▲ Fodder beet is a very valuable winter crop for both cattle and sheep, and digestive upsets or poisoning will not occur if the crop is managed correctly.

By V. J. WILLIAMS, Scientific Officer, and M. R. COUP, Toxicologist, both of Department of Agriculture Ruakura Animal Research Station, Hamilton

FODDER beet is a valuable crop for pigs, sheep, and cattle in winter, but when fed to cattle in excessive quantities it has caused digestive upsets and even death. In one of several outbreaks of beet poisoning in cattle in New Zealand 22 animals died and several others showed a marked digestive disturbance. There have been no field reports of poisoning in either sheep or pigs, but poisoning has been produced at Ruakura in sheep by dosing them with beet juice. Information gained from these field outbreaks and sheep dosing trials has enabled recommendations to be made on the variety and quantity of fodder beet which should be fed to sheep and cattle.

THE September 1955 issue of the "Journal" contained two informative articles on fodder beet, one, by A. Longwill, discussing fodder beet for pig feeding, and the other, by J. H. Claridge, describing the characteristics of the fodder beet plant as they affect its use for stock.

All fodder beets are a cross between mangels and sugar beets; mangels are low in sugar and dry matter and sugar beets are high in both. The amount of these substances in fodder beet varies considerably between these two extremes according to the varieties and the district in which they are grown.

As the sugar content and dry matter are directly related to one another, only the dry matter level need be considered. Though the dry matter varies with the district, all varieties vary to the same degree, so that all beets can be grouped according to the amount of dry matter irrespective of where they are grown. The sugar beets Klein, Maribo P, Hunsballe, and Hinderupgaard are very high in dry matter, and of the fodder beets, Pajbjerg Rex and Rex are high and Red Otofte and Korsroe are moderate.

Cause of Digestive Trouble

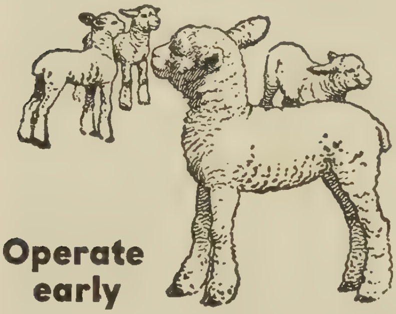
The tops of fodder beet contain balanced amounts of protein and carbohydrate and are suitable feed for growing or milking animals; the roots, however, where most of the dry matter is concentrated in the form of easily digestible carbohydrate, mainly sugar, are low in protein and should be supplemented by pasture. It is this carbohydrate which leads to digestive upsets in ruminants by interfering with the bacteria which aid digestion in the paunch. These digestive upsets will happen only when cattle are allowed to eat too much beet, particularly when they are first put on to it.

It is therefore imperative that fodder beets should be strictly rationed to cattle and sheep and that the animals should be introduced to them gradually. Sudden access to a full ration of roots or gorging can cause the animals to lose appetite, with marked loss of production in dairy stock. If the herd shows any sign of going off feed, it should be immediately removed from the crop and kept off it for 2 to 3 weeks. It may then be re-introduced to the crop in a smaller ration.

Gorging can also result in death. In these cases the animals suffer not only from severe indigestion, but in the paunch a toxin is formed which,

ELASTRATOR

and RUBBER RINGS for *Positive* LAMB TAILING and CASTRATION



Operate early

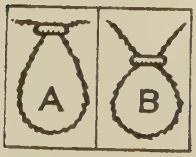
The younger the lambs the safer the operation.

- Seal the tail with an Elastrator ring, then immediately shear off the tail a little below the ring.
- This makes lamb tailing positive, bloodless, safe and practically painless.
- For lamb castration the Elastrator ring is bloodless and unsurpassed.

and for *Positive*

CALF CASTRATION

use the ELASTRATOR RING as follows:



A Place ring on purse making sure both Testes are in the purse.

B Pull ring down to position just above the Testes, this leaves plenty of room for COD FAT to develop.

From all
STOCK and STATION
AGENTS

or direct from

ELASTRATOR CO. LTD.
Box 226, Blenheim

Since 1872

the National Bank has been closely associated with farming in New Zealand in all its phases. The intimate knowledge of farmers' financial problems and needs is available to all its farmer customers.

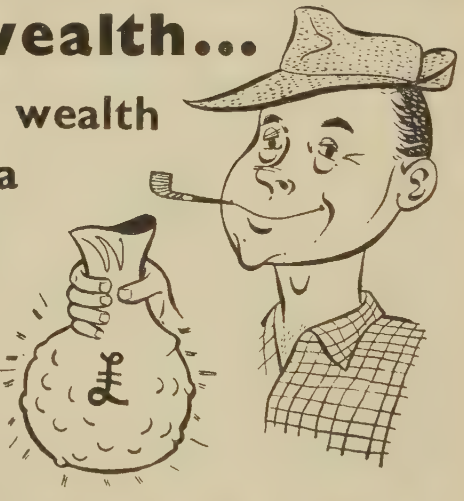
The National Bank
OF NEW ZEALAND LIMITED

147 Branches and Agencies throughout New Zealand.

3.7

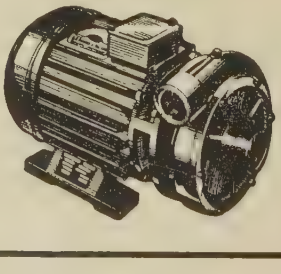
water is wealth...

and there's a wealth of water with a DAVIES PUMP



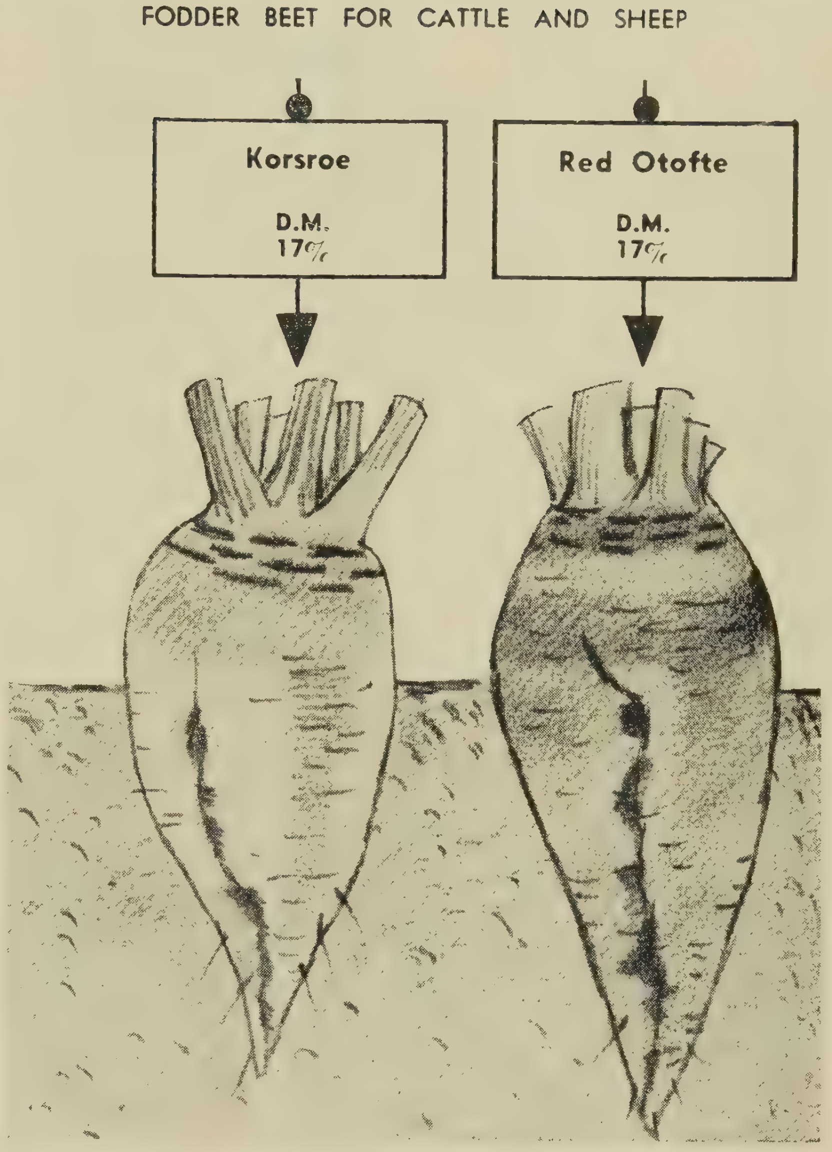
It's a fact — as long as you've got plenty of water on the farm you can be assured of a steady income. Davies have the right pump to suit your particular needs, including deep-well gearing, household pumps, shed washers, and centrifugals. Reliability is the keynote of every Davies Pump.

DAVIES



D. H. DAVIES & CO. LTD.
Penrose and Newmarket
AUCKLAND . . . Phone 594-531
DEALERS THROUGHOUT N.Z.

when absorbed into the body, causes marked concentration of the blood and consequently failure of the blood circulation.


FODDER BEET FOR CATTLE AND SHEEP
Korsroe
D.M.
17%
Red Otofte
D.M.
17%

For use in break feeding with an electric fence the fodder beet needed is one which does not grow too deeply in the ground and which produces a high amount of feed per acre without having a dry matter content high enough to make it excessively dangerous. The fodder beets which best fulfil these requirements are Korsroe and Red Otofte, each with a dry matter content of 17 per cent.

Suitable Varieties

In the selection of a suitable variety of beet one further point has to be considered; namely, the amount of the root that grows above the ground. This varies considerably with the variety. For use in break feeding with an electric fence the beet needed is one which does not grow too deeply in the ground and which produces a high amount of feed per acre without having a dry matter content high enough to make it excessively dangerous.

The fodder beets which best fulfil both these requirements are the varieties Red Otofte and Korsroe, which grow with only about half the root in the ground and are of moderate dry matter content.

The maximum amount of fodder beets such as Red Otofte and Korsroe which can safely be fed is about 40lb. per day for a Jersey cow and about 60lb. for a Friesian, and about 6lb. for an adult Romney ewe. This maximum amount must be reached gradually over about 2 to 3 weeks after feeding of the beet begins. Up to 10lb. are allowed for the first 3 days and 15lb. for the next 3, the quantity being gradually increased to the maximum during the following week or two. The quantity of roots fed per cow should be fairly accurately assessed. A few beets should be weighed, and then if the number of plants per row is counted, an estimate can be made of the number of rows required for a day's break or to be pulled.

If the ration is not introduced gradually in the manner described or if stock break into a crop and gorge themselves on beet, indigestion and poisoning are certain to occur.

Precautions Required

If varieties with a higher dry matter content than Red Otofte or Korsroe are fed to cattle or sheep, extreme care must be taken and the ration should be reduced below that recommended for these varieties. Information on the dry matter content of the different varieties can be obtained from the local Instructor in Agriculture.

In addition to this danger the tops may also cause two other types of poisoning, but they are less likely to occur and have not been recorded in New Zealand in cattle or sheep on fodder beet. One is nitrite poisoning and the other oxalate poisoning. The former is particularly liable to occur if the tops are fed off when immature. Poisoned animals may show staggers and laboured breathing or there may be sudden death without signs of sickness beforehand. To save an animal affected with this type of poisoning veterinary assistance should be sought at once. The oxalate poisoning produces signs similar to those seen in milk fever and can be cured by the same injection as is used for this disease.

Again it should be emphasised that if trouble does occur when cattle or sheep are put on fodder beet, the main thing to do is to stop feeding it for a week or two, and then introduce it again gradually with a lower maximum intake.

Though this report has concentrated on the dangers associated with fodder beet, it is emphasised that it is a very valuable winter crop for both cattle and sheep and that digestive upsets or poisoning will not occur if the crop is managed correctly.

proven achievement

PREM

LIQUID PHENOTHIAZINE

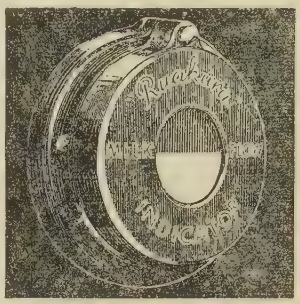
1. PREM has introduced non-settling, completely fluid drench. It does not settle out . . . pours freely to the last drop. Every batch is made under strict laboratory test and control.
2. PREM introduced the range of particle sizes for efficient worm control.
3. PREM introduced the convenient 1½" screw cap for easy pouring without waste.
4. PREM has been proved in use over the seasons.

PREMIER DRENCHING GUNS

TOP TEAM FOR FAST, CLEAN, ACCURATE DRENCHING!

The PHEN-MASTER, the first complete automatic drencher with built-in stomach tube, gives fast, clean, accurate drenching. The Premier range has instruments for every drenching need. The finest range anywhere!

PREMIER PRODUCTS LTD.
66 DIXON STREET, WELLINGTON
Available from Agents and Stockists everywhere.



SOMETHING NEW!
has been added
TO A TRIED AND TRUSTED MILKING SHED FRIEND.

"RUAKURA"
MILK FLOW INDICATORS

ARE NOW LEAKPROOF AND PRACTICALLY

UNBREAKABLE!!

EVEN A FALL ON TO A CONCRETE FLOOR WILL NOT DAMAGE THEM thanks to the incorporation of new "High Impact" Mouldings and . . .

LEAKS ARE NOW IMPOSSIBLE because the Milk Flow Indicator has been fitted with a special VACUUM-TIGHT SEPARATOR SEAL.

You'll get years of service from every "Ruakura" Milk Flow Indicator you install.

YOU GET MAXIMUM YIELD IN MINIMUM TIME with the "Ruakura" Milk Flow Indicator because it gives you:

- VISUAL PROOF OF LET-DOWN.
- INSTANT EVIDENCE OF THE END OF MILKING.
- VISUAL PROOF OF ANY MILKING ABNORMALITIES.

It completely supersedes the old-fashioned, hard-to-clean sight glass.

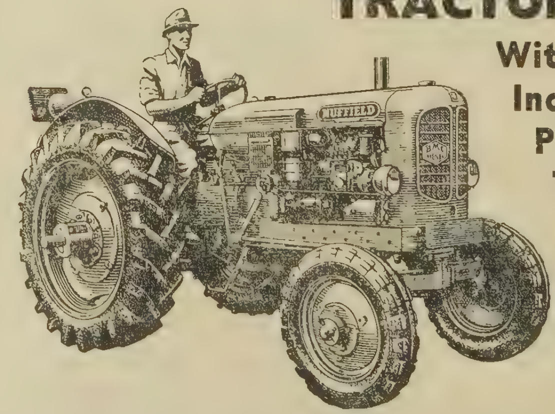
28/- each. Guaranteed 12 months.

FROM YOUR MILKING MACHINE MAKER OR SUPPLY HOUSE.
Manufactured by Plastic Products Ltd., Hamilton, New Zealand.

GREATER VERSATILITY THAN EVER!

NUFFIELD
UNIVERSAL

TRACTOR



With NEW Independent POWER TAKE-OFF
(Optional extra)

Enables tractor to be STOPPED, STARTED and SHIFTED INTO ANY GEAR WITHOUT INTERRUPTION OF P.T.O. Operation.

For IMMEDIATE DELIVERY Contact—

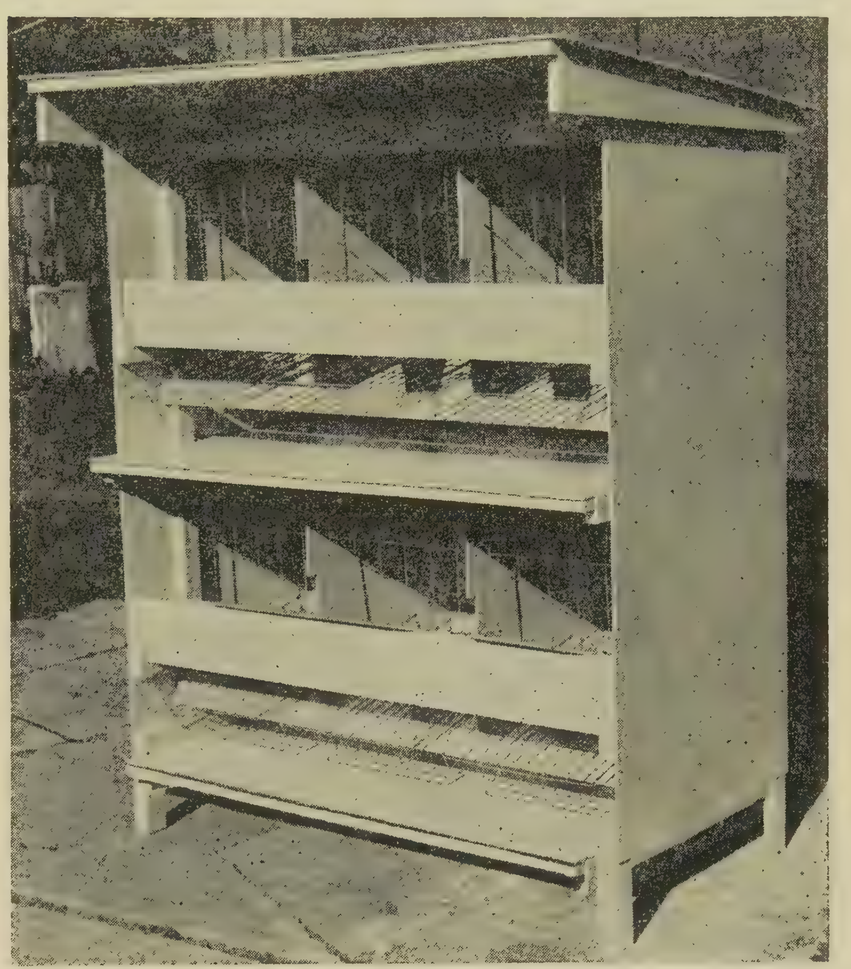
THE DOMINION MOTORS LTD.

Wellington, Auckland, Christchurch and Timaru.

Outdoor Cages for Household Laying Birds

THE practice of keeping animals confined to cages is not new. Rabbits, birds, and chickens for fattening have been handled in this way for hundreds of years. A great number of children's pets are still kept in this way. Confining of laying pullets to cages was started over 30 years ago and in recent years interest in this system of keeping poultry has spread to New Zealand. Efficient farmers, particularly those specialising in egg production, have become cage conscious because it is realised that cages present a most efficient method of producing eggs through the opportunity for close supervision. In this month's article P. Josland, Poultry Instructor, Department of Agriculture, Wellington, discusses the use of the cage system for the household poultry keeper.

FOR many household poultry keepers the use of the cage system would go far in maintaining the health of the birds by avoiding overcrowding and dirty conditions. The rat menace is greatly reduced. Increased production can be expected in that each bird is able to obtain its full share of food, as bullying can no longer occur and all the birds have an equal chance to give of their best. Often in a flock of pullets, regardless of the number housed together, there are timid and bullied birds. Such birds rarely obtain sufficient food for necessary body growth, maintenance, and production, and they develop slowly and produce poorly. It is surprising just how well this type of bird develops and produces when it is in a cage and unharassed by the other birds.

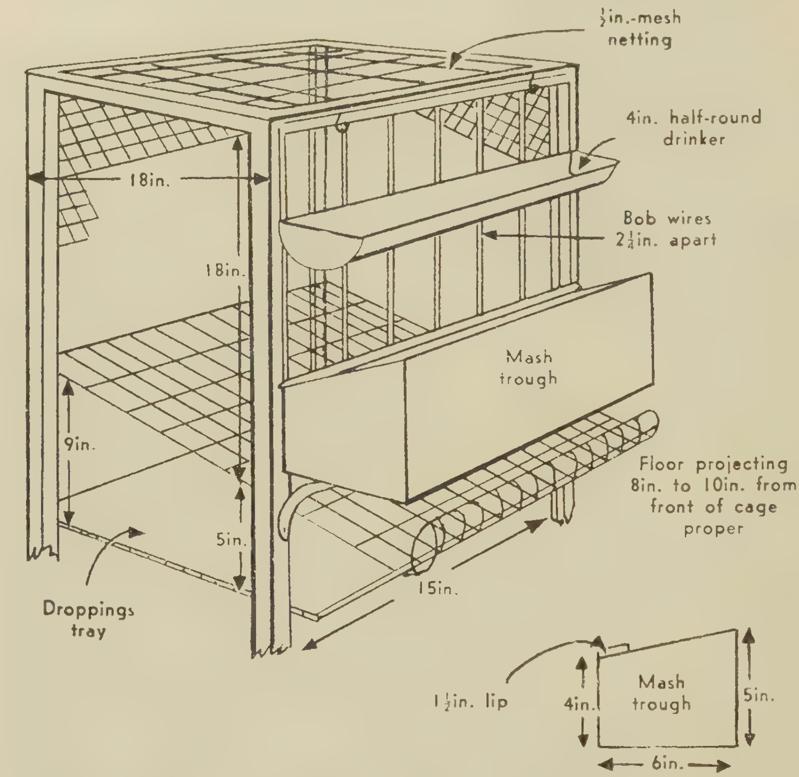

An excellently constructed laying cage unit for six birds. The overhead hood protects against rain and the solid sides protect against draughts. The droppings trays may be pulled out for cleaning.

▼ An outdoor laying cage unit for six birds, utilising the side of a shed for shelter. There is no droppings tray. The droppings are allowed to fall on the ground and are disposed of in the garden or compost heap when necessary.

Also with the cage system it is easy for the householder to note which birds are laying and with little extra effort to record the individual production. Thus the non-producer or poor layer can be detected easily and culled, food being thereby saved. Cull birds, if healthy and in good condition, make excellent table birds. Furthermore, the cage system would require less attention at the weekends, when the householder may wish to be away for at least part of the time.

An Outdoor Battery

The big advantage of an outdoor battery is the economy on housing, equipment, and space required. The position in which the cage unit is placed is important. A sheltered spot should be chosen and a wall or back



A laying battery cage, showing principal dimensions. There must be a clearance of 2½in. between the wire floor and the bottom of the cage front to allow eggs to roll to the front of the floor.

of a shed often makes a suitable windbreak. When a wall or shed is available it is easy to construct a shelter for the cages. The cages should have a hood at the front to help keep out the rain and the sides should extend 6in. below the floors to prevent direct draughts.

Cages can be bought ready made or, if home made, at least the floors should be purchased. It is difficult to make a first-class floor. A reasonably satisfactory floor can be constructed of ordinary galvanised, 16-gauge, 1in.-mesh wire netting. The wire should be tightly stretched over 1in. x 1½in. framing resting on cross bearers at the back and front of the cage. An extra ½in. should be allowed in the fall of the floor if it is home made. Any sagging in this netting due to the weight of the birds standing on it will defeat the object of the sloping floor, which is to cause eggs to roll to the front immediately they are laid. Failure in this respect will lead to broken eggs and egg eating.

A removable droppings tray is necessary. This can be cleaned once a week and the manure disposed of in the garden or compost heap. The sides of the tray should be turned up so that when it is removed to be scraped, the droppings do not spill. The tray should cover the whole area of the egg floor when the cages are tiered. This prevents the birds in the lower and centre cages stretching their heads and pecking the eggs above and also prevents fouling of the feed and water troughs of the lower cages. The distance from the egg floor to the droppings tray should not be less than 4½in. This allows for a week's accumulation of manure without the cage floor being fouled.

Choice of Stock

When the type of bird to keep in the laying cages is being chosen consideration should be given to either a heavy breed, such as an Australorp or Rhode Island Red, or one of the first crosses now so popular with household poultry keepers in this country. Those most easily bought are the White Leghorn cross Australorp or the reverse cross or the White Leghorn cross Rhode Island Red. However, there is no best breed or cross for cage production. The essential point is that the birds should be bought from a reputable breeder and be bred from good, healthy, and productive stock.

Heavy or crossbred pullets properly managed lay well, particularly in winter, and at the end of their laying year make good table birds. These breeds are quiet to handle in the cages, being more docile than a light breed such as a White Leghorn.

Broodiness, a characteristic of heavy or crossbred birds, and considered such a nuisance, is not a serious problem when birds are kept in cages. If broodiness occurs, it does not continue for long.

Replacement of Flock

For maximum winter production it is necessary to replace the flock with new pullets annually. A bird's production is greatest during the first or pullet year and if birds are kept for a second year, they are moulting during part of the winter when egg prices are high.

The household poultry keeper is well advised to buy either pullets on lay or perching pullets. The latter are about 8 to 10 weeks of age, hardened off heat, and taught to perch. With cages, however, perching is not important, because the birds do not perch. Rearing day-old chickens is a skilled job and the average householder has not the facilities, equipment, or time to make the buying of day-old chicks worth while.

The ideal perching pullets are those ordered from hatchings in August for heavy breeds and September for crossbreds, delivery being taken 8 to 10 weeks later. Because of the heavy demand for stock hatched in those months orders should be placed 6 months before the pullets are wanted. If spare cages are available, birds of different ages can be kept without mixing. Very often birds of different ages are mixed together with detrimental results caused by the older and more advanced birds bullying and pecking the younger ones.

The cage system has been referred to as a cruel method of keeping poultry. This idea has been entirely exploded. On the question of cruelty the following points should be considered.

1. Every bird is closely supervised and under constant observation. A sick or ailing bird can be seen immediately and treated or culled.
2. Bullying is eliminated.
3. Food and water supplies are adequate and birds feed readily.
4. Compare their sanitary conditions with those of birds kept in unhygienic sheds and runs.
5. The final test—egg production is excellent and the health of the birds good.

If birds were being treated cruelly, it is most unlikely that they would remain healthy, eat well, and produce heavily. There is no cruelty when birds are managed and fed properly in cages.

Feeding and management in cages are to be discussed in a later article.

Land Development on a Northland Problem Soil

By R. G. WARREN,
Instructor in Agriculture, Department of Agriculture, Dannevirke

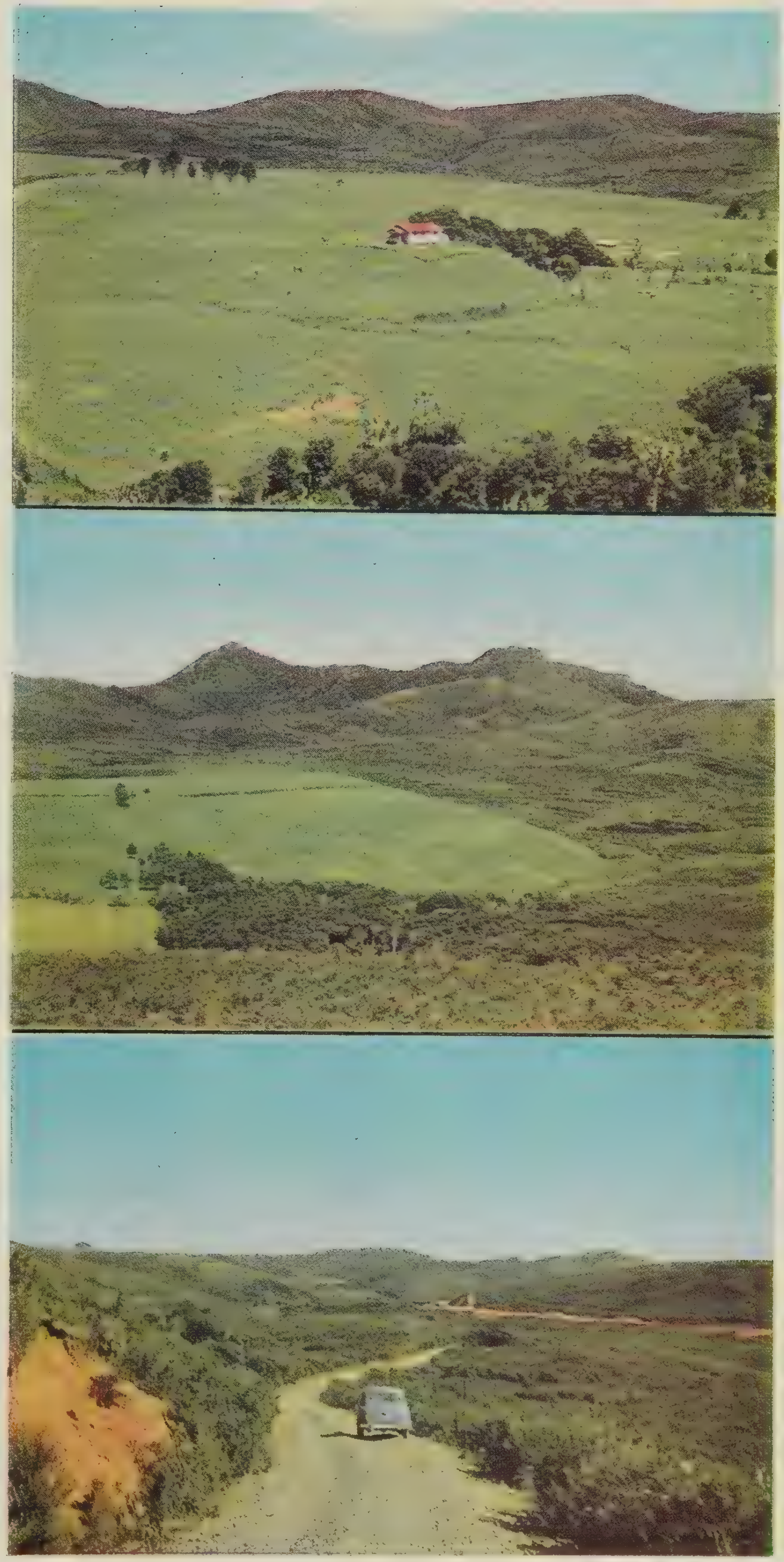
IN 3 years an area of 50 acres on one of the problem soils of Northland has been raised from a unit producing practically nothing to a farm producing 120lb. of butterfat per acre. With casual work which is available in the district the owner is now able to obtain a satisfactory living.

THE farm is 12 miles north of Kaeo, the soil being known as Rangiuru clay, which is deficient in molybdenum. When the present owner, Mr. J. Peterson, took over shortly after the Second World War he began by regrassing 24 acres, but the pastures deteriorated because of the use of unsuitable fertiliser, inadequate stocking, and lack of finance. During this period Mr. Peterson worked on farms in the district and managed to build his own house.

In late 1952 he obtained a loan of £2970 from the Maori Affairs Department and began development work in earnest. The whole area was disced, fallowed for 12 months, redisced, harrowed, rolled, and finally sown to pasture in March 1954. One ton of lime and 3cwt. of superphosphate per acre were applied at sowing down, and though the grass and clover struck well, subsequent growth was poor. A new milking shed was built and by September 1954 11 cows were being milked.

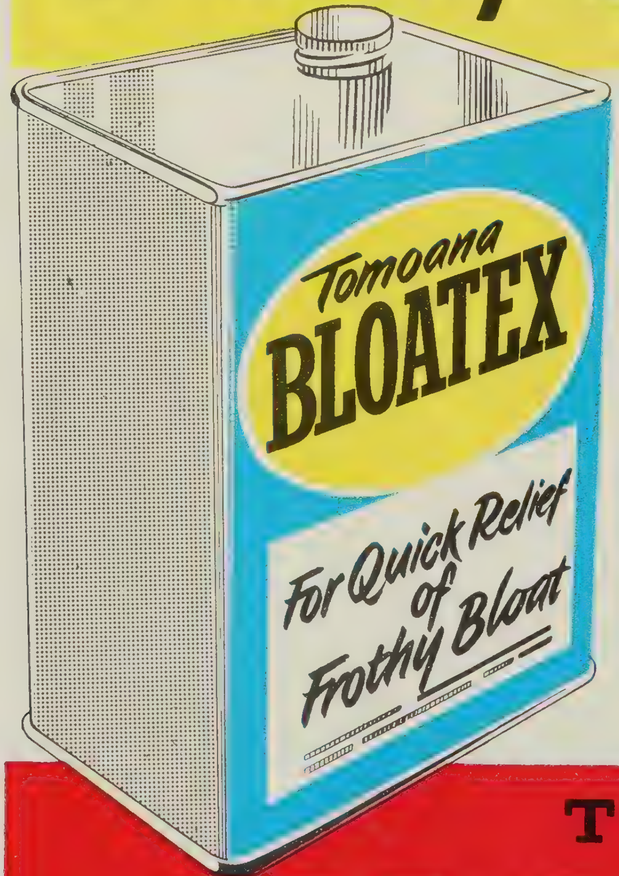
As the soil was known to be deficient in molybdenum, it was topdressed with 3cwt. per acre of molybdenised superphosphate in October 1954 and 20 tons of lime were applied at the same time. Results were encouraging, but it was too late in the season to increase the herd, so 6 acres were closed for hay and yielded 104 bales per acre.

Butterfat production figures for 1955-56 and 1956-57 were 6000lb. and 4882lb. respectively. Despite the fall in the last season it is considered that 6250lb., the potential estimated by the Maori Affairs Department in its development plan, will soon be reached.



Upper—The farm early in 1956; 3 → years before pastures were run out and almost no stock could be carried. Middle—Improved portion of farm and undeveloped land. Lower—The district has large areas of undeveloped land which could be developed to give production similar to that obtained on Mr. Peterson's farm.

End the Worry of Frothy BLOAT


Tomoana
BLOATEX
For Quick Relief of Frothy Bloat

UNTIL the scientists can satisfactorily breed a strain of non-bloating clover we must face up to the necessity of controlling frothy Bloat, which is caused by present day clover-rich pastures. "Bloatex" controls frothy Bloat with dramatic swiftness. In many cases a single dose acts in a few minutes. In most cases frothy Bloat is completely relieved in under an hour, so you can't afford to be without "Bloatex" this season. Available in one and 4 gallon tins.

TOMOANA

Order BLOATEX

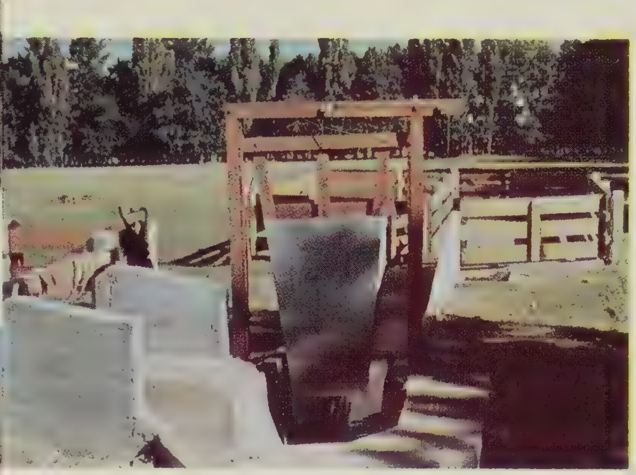
from your Produce Merchant today

W. & R. FLETCHER (N.Z.) LTD. WELLINGTON and AUCKLAND

Prevent Child Drownings with Covers for Sheep Dips

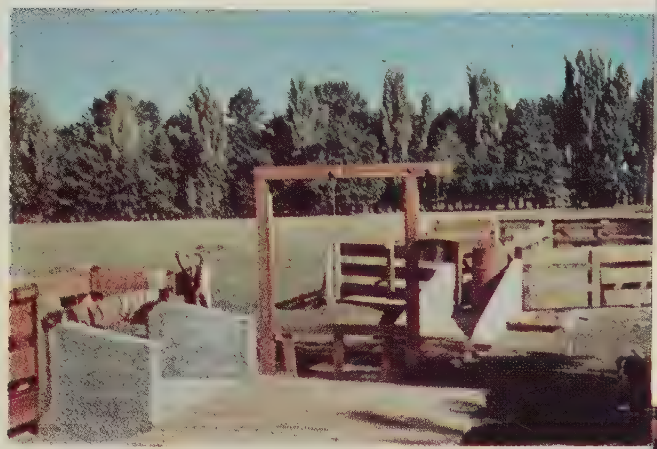
The urgent need for every farmer owning a sheep dip to build and fit a cover to it is clearly illustrated in this authentic case history.

This 16-months-old small boy wandered away from his home on a farm one autumn morning.

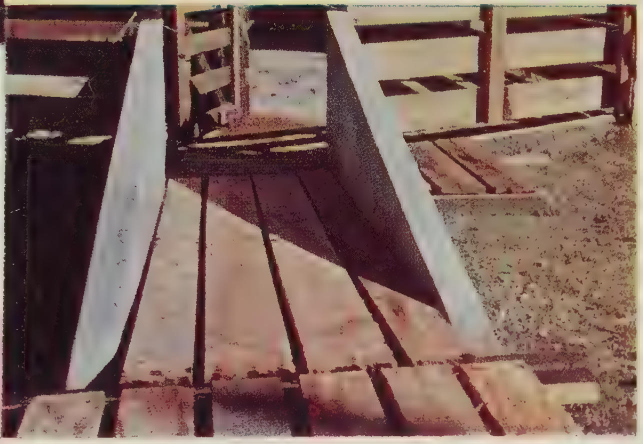


About five minutes later he was found floating face down in the bowl of this sheep dip and was taken from it blue faced and unconscious. His breathing had stopped.

Prompt artificial respiration by his mother and later assistance from a doctor who travelled many miles to the scene saved his life. Yet he could easily have drowned.



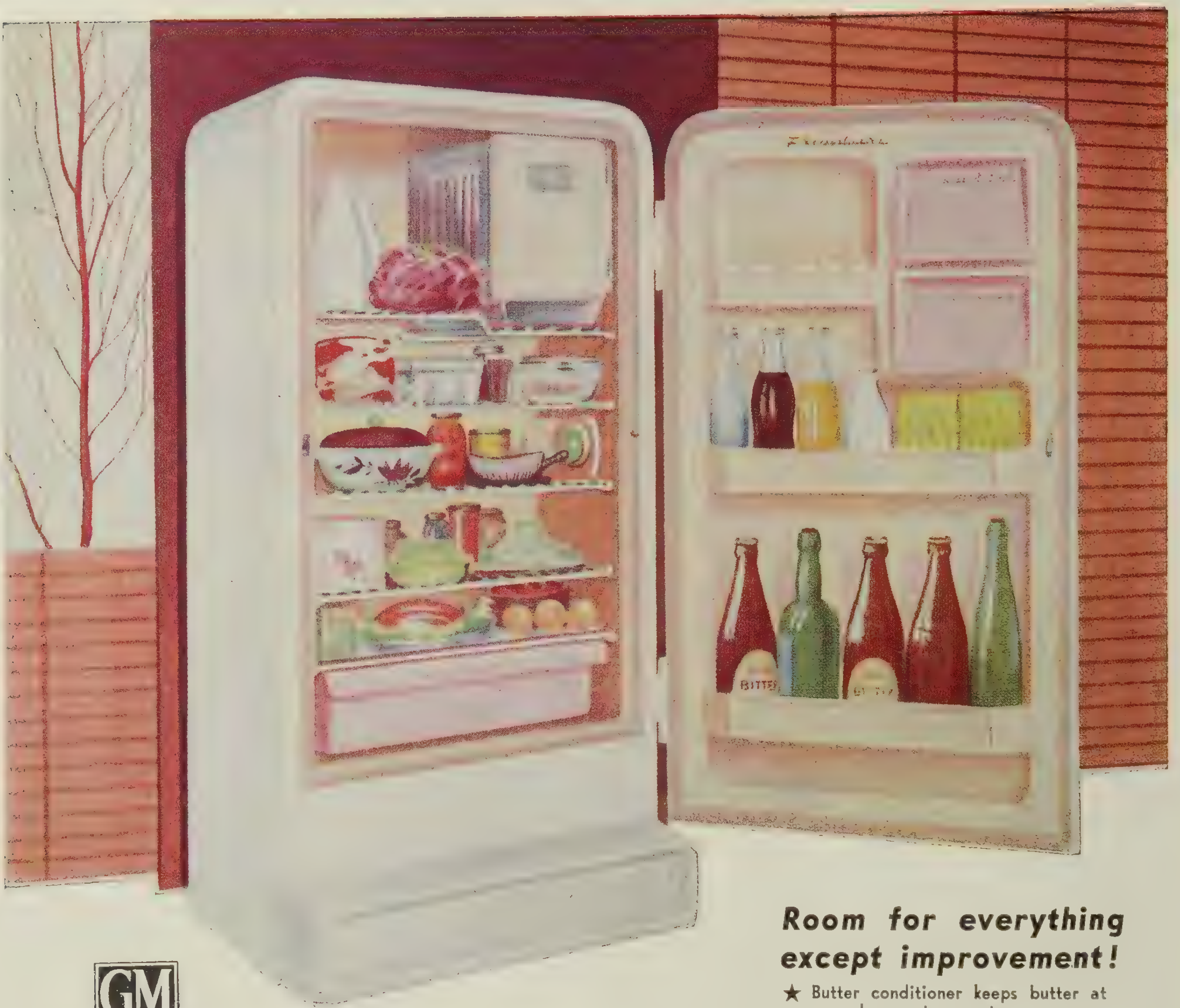
The partly constructed dip was three-quarters full of water to test for leaks. After the annual sheep dipping a cover was built to make the dip safe for children.



The cover was built of timber in sections too heavy to be lifted by children but able to be handled by adults. It was built in half a day for less than £5 worth of materials.

A few pounds and a little foresight will prevent tragic drownings of children in sheep dips.

Seven children have lost their lives in this way in recent years.



GM
GENERAL
MOTORS

The new

FRIGIDAIRE

REGD TRADE MARK

REFRIGERATOR

with the 1958 features

Take a good view of the new six-point-two. It's an eye opener!

Distributed by FRIGIDAIRE Division of General Motors New Zealand Limited through a New Zealand-wide network of Authorised Dealers

Room for everything except improvement!

- ★ Butter conditioner keeps butter at spread easy temperatures thermostatically. An exclusive Frigidaire first!
- ★ New cheese compartment . . . prevents taint of other foods . . .
- ★ Easy sliding vegetable hydrator keeps vegetables dew fresh, crisp.
- ★ New Quick-Cubelet Ice Tray serves 36 cocktail-size cubelets.
- ★ Super freezer holds 14lbs. of frozen foods.
- ★ New storage door has three versatile shelves allowing for 2½ doz. eggs . . . or if you wish, the roomy bottom shelf holds five large bottles . . . middle shelf is ideal for lemonade, sauces, half pints of cream, etc. Awkward little extras fit snugly into the top shelf.

6.2 cu. ft. De Luxe Model D-62
£99/10/-

8.8 cu. ft. De Luxe Model D-88
£127/10/-

Quality *is your safeguard*

'PHENOTAS' DRENCH

TVL
'PHENOTAS'
Registered
DRENCH
TASMAN VACCINE LABORATORY LIMITED. BOX 29. UPPER HUTT

'PHENOTAS' — the TVL brand of Phenothiazine — is produced by the Tasman Vaccine Laboratory Limited under the same stringent conditions of scientific control as all the well-known TVL vaccines and pharmaceuticals.

TVL

TASMAN VACCINE LABORATORY LIMITED
P.O. Box 29, Upper Hutt.

Central Otago—
a Changing Grassland Scene

S. H. SAXBY, Assistant Director, Extension Division, Department of Agriculture, Wellington, the author of this article, has been closely associated with efforts to find means of restoring the depleted areas of Central Otago. Here he describes how at last the face of the land is changing.

The author spent 9 years as an Instructor in Agriculture in Otago and before that was on the staff of the Grasslands Division of the Department of Scientific and Industrial Research. He is president of the New Zealand Grassland Association and author of Department of Agriculture Bulletin No. 250 "Pasture Production in New Zealand".

FOR many years the low-rainfall areas of Central Otago have been of note for their rich historical interest, their rabbits, and their large area of grey, mat-forming scabweed. For a long time also investigations have been carried out with the object of replacing the scabweed with useful pasture plants, but though much information was secured on grasses which would grow provided they were protected from grazing by sheep and rabbits, it was never possible for any of this information to be put into practice by those who farmed the land.

COLD winters and hot, dry summers were thought to be one of the major factors limiting improvement, yet within the fenced-off areas a surprising variety of grasses and clovers would grow and survive. Climate was one limiting factor, but the most important and destructive one was the rabbit. Rabbits were so plentiful and so voracious that they left the ground denuded except for the patches of scabweed, which were quite unpalatable to sheep and rabbits. For many years grasses and clovers have been tried out by the Extension Division of the Department of Agriculture at Earnscleugh, Wanaka, Ardgour Valley, the Dunstan Range, Pisa Flats, Bannockburn, Springvale, Ophir, Fruitlands, Hawea Flat, and many other places. Hardly ever could the information secured be put into practice because of the ever-present hordes of rabbits.

Under these conditions the work was discouraging to those who were carrying it out and whose only hope was that some day the rabbit would be destroyed. The work was carried on under considerable difficulties, always with the rather forlorn hope that the time would come when the rabbit would be so reduced that the information gained would be put into practice.

For years the fenced-off, rabbit-free areas, whether large or small, stood out as monuments of unfulfilled hopes in an apparently endless sea of scabweed, rocks, and rabbits.

Dramatic Change

Today all this is changing: The rabbit has been made worthless through the action of the Rabbit Destruction Council. Rabbit boards have carried out a concentrated plan of destruction. As a result rabbits have been so reduced that in many areas they are no longer the chief agent limiting the growth and survival of palatable plants. A few rabbits are still seen, but only in the early morning and in the evening. No longer are the roads littered with the carcasses of rabbits run over by night travelling cars; no longer do the hawks obtain easily secured meals on the roads.

This wholesale destruction of the rabbit is now effecting, certainly slowly, a transformation in the depleted country of Central Otago.

For many years scabweed has been regarded as a worthless plant—quite unpalatable and therefore of no use. If rabbits can be kept down, there is little doubt that, in retrospect, the value of the scabweed will be appreciated, because over the years it has acted as a caretaker of the soil. As the result of wind and water erosion enormous quantities of soil have been blown and washed away, but the scabweed has played a very important part in soil retention. Its spreading habit has not only provided a windproof blanket for the soil, but over the years has trapped at least some of the wind- and waterborne, dusty soil. Unquestionably the much maligned scabweed has been a blessing in disguise.

A visitor now passing through this country after an absence of a few years is amazed to find that the sea of dull grey scabweed he has so long associated with this depleted area no longer dominates the landscape. In spring and autumn he sees a tinge of green over the hills and flats; in summer he sees the thin brown veneer of sun-dried grass. The face of Central Otago's problem lands is changing from year-round grey to alternating green and brown as one season follows another.

Scabweed Being Replaced

The scabweed is still there, but it is being overtopped by grasses, mainly annuals. Hairgrasses and brome grass are increasing rapidly and the not very useful haresfoot trefoil is spreading slowly. A community of annuals is gradually replacing the scabweed.

Dead and dying scabweed is abundant. This soil- and moisture-conserving organic matter provides an excellent seed-bed in which plants can establish. A mild winter in 1956 and the wet summer which followed both did much to speed up the ingress of this annual vegetation.

The information gained from years of experiment during the period of rabbit infestation can now be put into practice. Many of the trials laid down by the Department of Agriculture have included a wide range of drought-tolerant pasture species as well as some of the commonly used plants, such as ryegrass, crested dogstail, and cocksfoot. In many places cocksfoot, white clover, and red clover have established and grown well. There has, however, always been the suspicion that some unusual conditions were favouring their survival.

Rocky hill country where more useful vegetation is beginning to replace scabweed

Scabweed, which for many years has served as a caretaker of the soil.

Useful grasses and clovers replacing scabweed

STOP BLOWFLY STRIKE

NEW

Powerful
Prolonged Protection!

GEIGY DIAZINON 20E

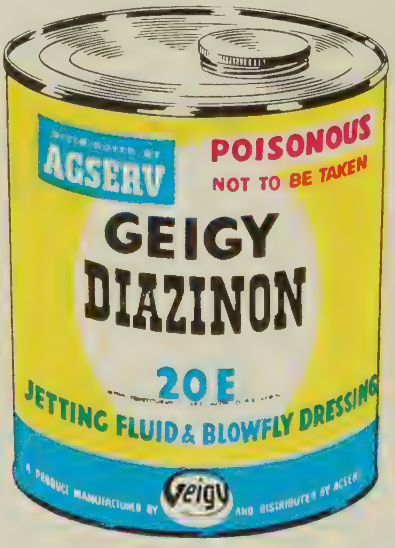
JETTING FLUID and BLOWFLY DRESSING

The amazing new chemical, Diazinon, developed by the world-famous laboratories of Geigy (discoverers of D.D.T. as insecticide) is now released in New Zealand as an effective, lasting means of protection against fly-strike.

Also ask for Geigy Diazinon Sheep Dip.

- Low toxicity
- Harmless to wool and carcase
- Not affected by weather
- Proven commercially in Australia
- Proven experimentally in New Zealand

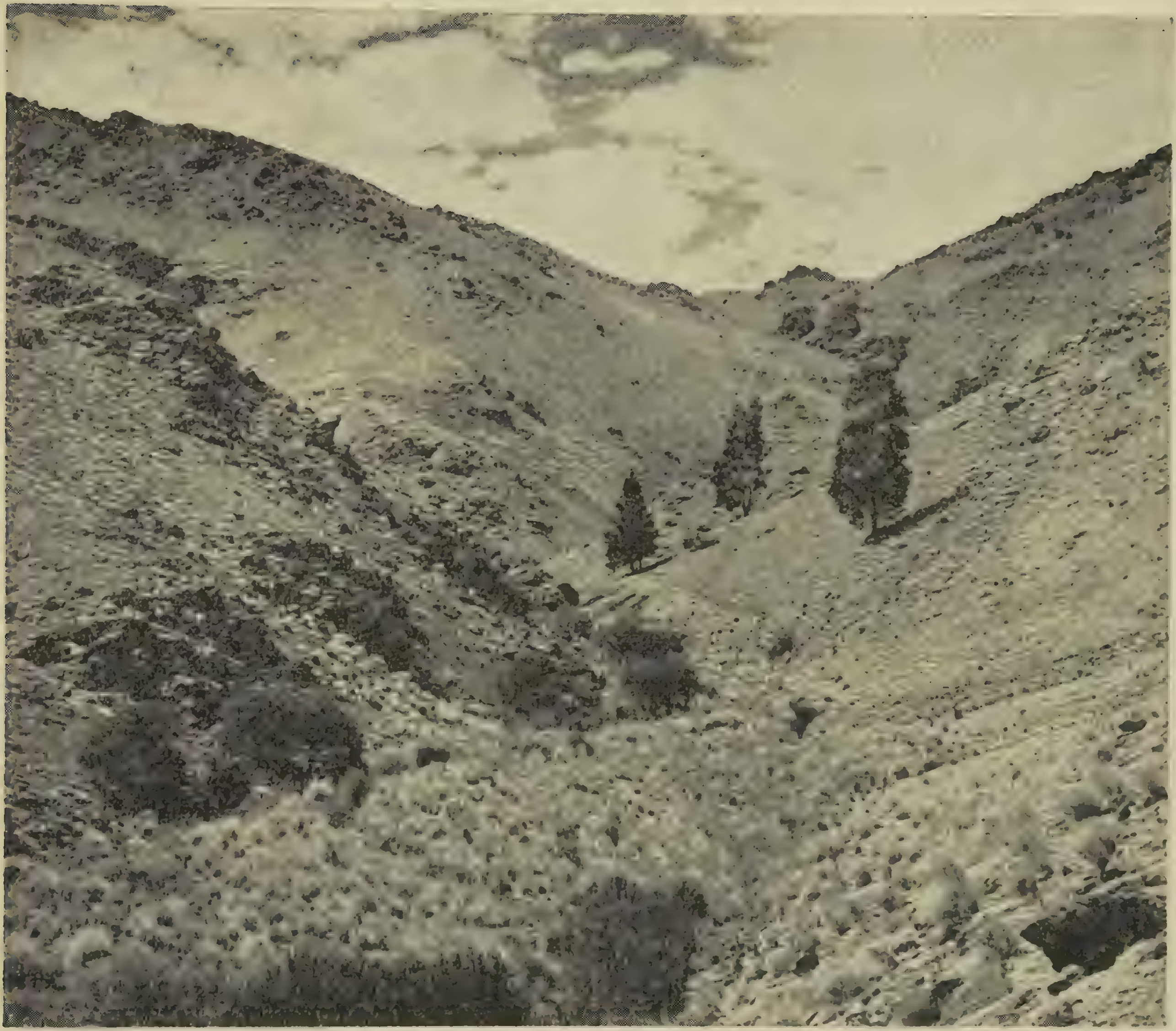
Get full details and order now from your Stock and Station Agent.


AGSERV
POISONOUS
NOT TO BE TAKEN
GEIGY
DIAZINON
20E
JETTING FLUID & BLOWFLY DRESSING
Geigy

Distributed throughout N.Z. by AGSERV, Box 412, New Plymouth

— FIRST IN THE FIELD WITH DIAZINON —

CENTRAL OTAGO — A CHANGING GRASSLAND SCENE



For many years the vegetation of the depleted country of Central Otago has been dominated by the mat-forming, grey scabweed. Tussock and matagouri have survived in moist places. The trees in the middle distance are in a fenced-off plot which was sown in 1922.

Surface Sowings

Surface sowings by runholders during the last year or two have shown that cocksfoot and white and red clovers will establish and survive, at least in the valley floors and on shady faces. Experimental evidence shows that lucerne will also grow on this country.

All the evidence available indicates that the introduction of cocksfoot, lucerne, and, on valley floors and shady faces, white and red clovers is likely to give satisfactory results.

Several other species of grass such as *Bromus inermis*, *Bromus marginatus*, and tall oat grass look promising, but cannot be evaluated until grazing trials lasting a year or two have been conducted. Grazing trials are essential to ensure not only that the grasses will grow but that they will be grazed readily by sheep. For example, love grass (*Eragrostis curvula*) established and grew well in plant nurseries, but was completely neglected when an area of it was opened for grazing by sheep.

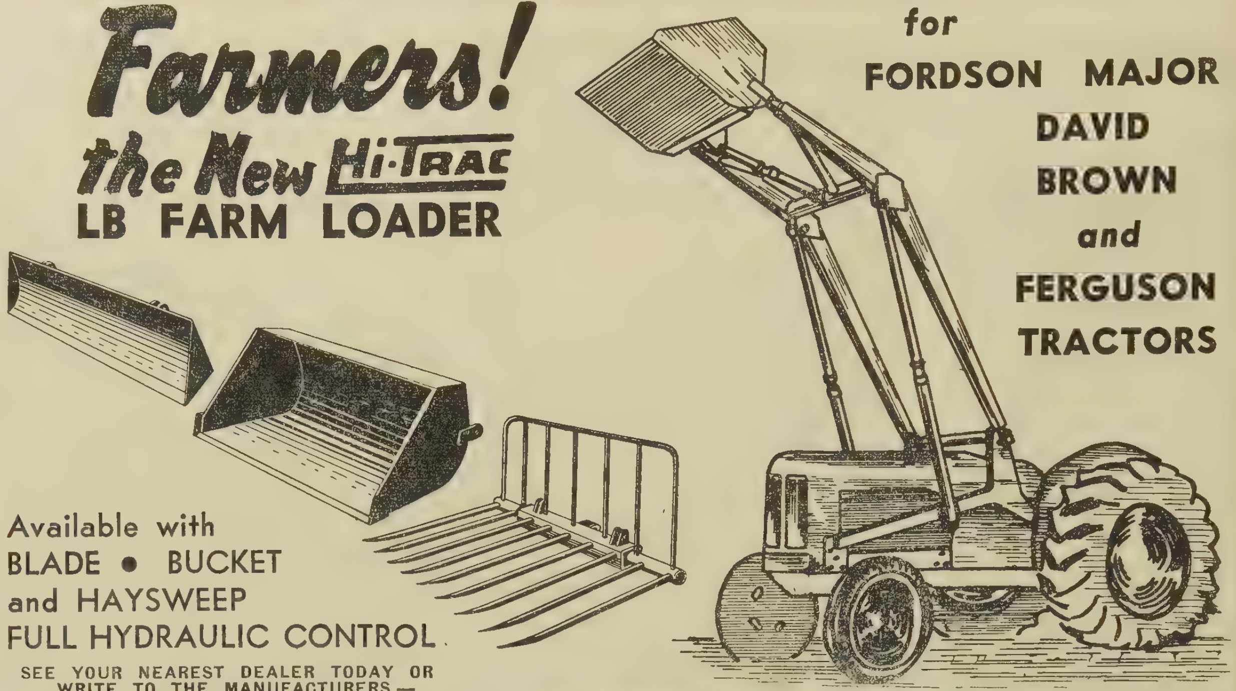
Numerous trials carried out by the Department of Agriculture have shown that pasture species can be introduced most satisfactorily by burying the seed in the ground. Several makes of machine are now available which either disturb the soil or make grooves into which the seed can fall. Wherever it is possible to take wheeled machinery this method is advocated.

Where machinery cannot be taken the only method of introduction is surface sowing. This can now be done rapidly by the use of aeroplanes and with this method the cost is a great deal less than that for hand sowing. However, the strike of seed resulting from aerial sowing **on** the ground is not nearly as good as that from mechanical sowing of the seed **in** the ground.

So far the ingress of the annual plants and the introduction of perennial grasses and clovers have been considered. It is necessary to realise that native grasses, too, are recovering.

Farmers!
the New HI-TRAC
LB FARM LOADER

for
FORDSON MAJOR
DAVID
BROWN
and
FERGUSON
TRACTORS



Available with
BLADE • BUCKET
and HAYSWEEP
FULL HYDRAULIC CONTROL

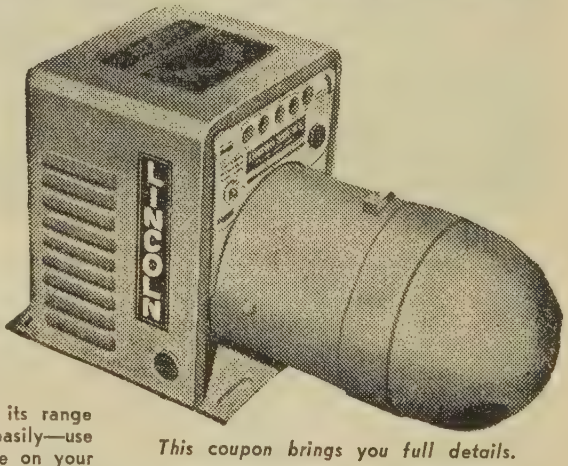
SEE YOUR NEAREST DEALER TODAY OR
WRITE TO THE MANUFACTURERS—

C.W.F. Hamilton & Co. Ltd.
P.O. BOX 709
CHRISTCHURCH

THE LOWEST PRICED FARM GENERATOR YOU CAN BUY!

With a welding range of 40 - 250 Amps.

LINCWELDER
250 B.T.



You can buy a cheaper machine than the BIG Lincwelder 250 B.T. BUT HAS IT THE CAPACITY TO HANDLE EASILY ALL WELDING JOBS—use deep-penetrating 7/32" electrodes on heavy steel sections—weld anything within its range of 40-250 amps.—cut heavy iron and steel easily—use 32 V. power for lights and tools—go anywhere on your property? Has it heavy-duty ball bearings—non-inflammable insulation—large, rigid shaft—cooler operation?

For its size and capacity you can't buy a welder at a better price than the Lincwelder 250 B.T.

LINCOLN

Distributors throughout Australia and New Zealand.

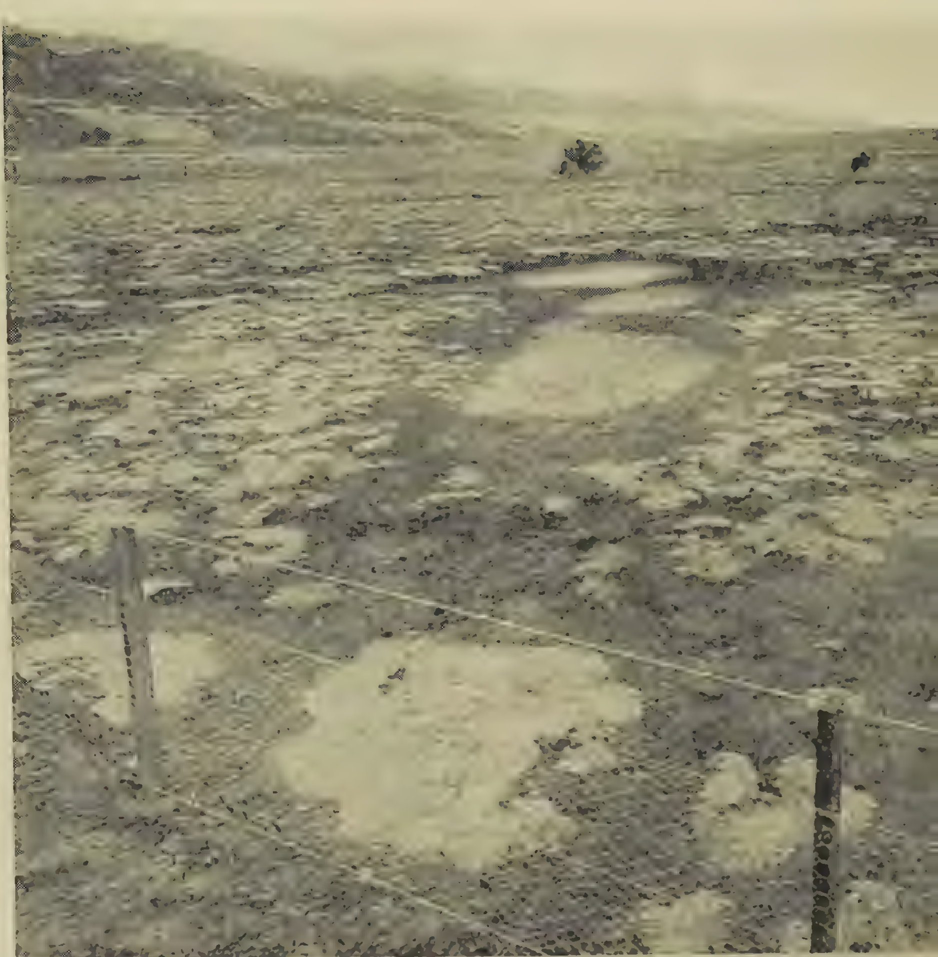
This coupon brings you full details.

The Lincoln Electric Co. (Aust.) Pty. Ltd.
P.O. Box 1482, Wellington, C.3, N.Z.
Please send details of new Lincwelder 250 B.T. for
Belt drive ☐ Electric drive ☐ Engine drive ☐
NAME ....
ADDRESS ....
....

WORLD'S LARGEST MANUFACTURERS OF ARC WELDING EQUIPMENT

CENTRAL OTAGO . . .

All through the tussock country small, isolated communities of native grasses have managed to survive in places such as rock crevices and damp areas. Where rabbits could not kill them out these plants are now recovering rapidly and are setting and shedding their seed. Within a few years a marked increase in the native grasses can confidently be expected. Blue wheat grass, fescue, silver and blue tussocks, and plume grass are now conspicuous in areas where a few years ago only odd plants were seen.



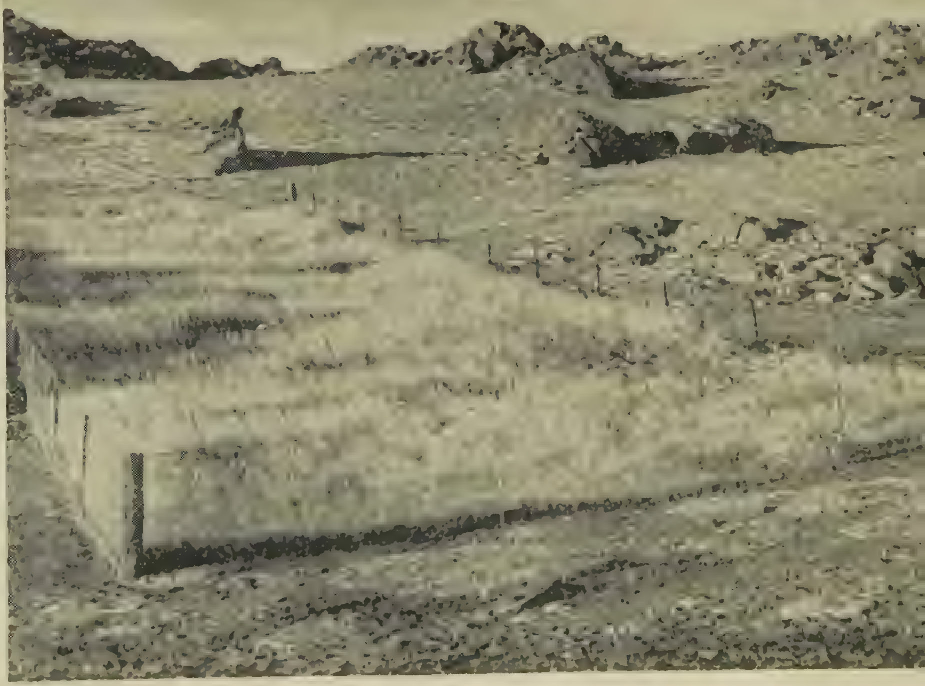
With an abundance of rabbits and → a low rainfall flats such as this were bared of almost all vegetation except scabweed.

New Era

All in all there is every indication that within the next 10 years or so the depleted country of Central Otago will be transformed. Already annual grasses and clovers have started to replace the scabweed and there is every reason to believe that on much of the country perennial grasses and legumes will replace much of the annual grass.

The easing of grazing pressure on the plant cover by the destruction of rabbits has brought one problem in its train: The better conditions assist the growth of some weeds as much as they benefit useful species. This was foreseen a number of years ago when in enclosed areas unpalatable plants such as sweet brier, matagouri, and native broom became established.

For some years the Department of Agriculture has been experimenting with various chemicals with the object of controlling sweet brier. Considerable progress has been made and established bushes can be controlled individually, but no satisfactory method has yet been found for controlling seedling plants economically.



Over the years small plots which → were fenced off from grazing showed that a number of different grasses could be grown successfully. Now that rabbits have been controlled there is no reason why the lessons learnt from the fenced plots cannot be applied to large areas.

The future of the depleted land of Central Otago has never looked brighter. Native grasses are regenerating and the sowing of introduced grasses and legumes has passed beyond the experimental stage. A watch must, however, be kept on the ingress of unpalatable plants, such as brier, gorse, and broom, which unless checked when in small amounts could eventually take charge.

Put "bloom" on Show cattle with

"DOMINION" BRAND LINSEED Stock Foods

While important to all farmers wherever supplementary feeding is required, "Dominion" Linseed stock foods are particularly valuable, because of their high linseed content, in the preparation of show stock.

Linseed imparts bloom; gives coats a glossy appearance; has a relaxing and laxative effect which puts stock in peak condition for early shows.

"Dominion" Stock Foods are available in two types; genuine PURE LINSEED Kibbled Nuts or Linseed based pellets . . . both suitable for stall or yard feeding.

RETAIL PRICES

"DOMINION" LINSEED BASED PELLETS

Per ton freight paid to nearest railhead—

CHRISTCHURCH and SOUTH	OTHER SOUTH ISLAND AREAS	Per ton ex port NORTH ISLAND
£38	£38/10/-	£39

"DOMINION" Genuine Pure Linseed KIBBLED NUTS

Per ton freight paid to nearest railhead—

CHRISTCHURCH and SOUTH	OTHER SOUTH ISLAND AREAS	Per ton ex port NORTH ISLAND
£45	£45/15/-	£46/5/-

Both foods available in 125 lb. hessian bags from your STOCK or STATION AGENT.
Trade enquiries: P.O. Box 2052, Wellington; P.O. Box 1168, Christchurch; P.O. Box 67, Dunedin.

THE JOURNAL OF THE BRITISH GRASSLAND SOCIETY

This Journal is a medium for the publication of the results of research and practical experience in the realm of Grassland Husbandry.

CONTENTS: Volume XII. No. 1. 1957

1.	Permanent versus Temporary Pasture	J. H. Smith
2.	Grazing Management for Seed Production in Leafy Strains of Grasses	J. O. Green and T. A. Evans
3.	The Sulphur Cycle in Grassland Soils	T. W. Walker
4.	Note on the Extent and Significance of Losses in Live Weight of Inwintered Cattle on Turning Out to Grass in Spring	J. D. Ivins and J. T. Morgan
5.	The Estimation of Feed Intake by Sheep on a Silage Diet	P. McDonald and D. Purves
6.	The Renovation of Downland Permanent Pasture. 1. Surface Cultivation and Seeding	M. J. T. Norman and J. O. Green
7.	The Vegetation of the Pewsey Vale Escarpment, Wiltshire	A. S. Thomas, M. Rawes and W. J. L. Banner
8.	Studies on the Root Development of Herbage Plants. 1. Techniques of Herbage Root Investigation	T. E. Williams and H. K. Baker
9.	Effects of Defoliation and Soil Moisture on Grassland Re-Growth	August Jäntti and Reijo Heinonen
10.	Book Review.	

This journal is published quarterly. Subscription Volume 1, 15/- or $2.
Annual Subscription thereafter 30/- or $4 per volume.

Orders to: The Secretary, British Grassland Society,
69 May Street, Belfast, Northern Ireland.

No Benefit from Subsurface Placement of Phosphatic Fertilisers in Pasture

By J. KARLOVSKY,
Research Officer, Department of Agriculture's Rukuhia Soil Research Station, Hamilton

THOUGH recent overseas experiments have shown that row crops use phosphate better when it is placed close to the roots than when it is broadcast, no similar beneficial effects in pastures by subsurface placement of phosphatic fertilisers were obtained in Department of Agriculture trials. On the contrary, the implement used to place fertilisers at varying depths in pasture depressed growth and the fertiliser so placed did not encourage deeper rooting of species.

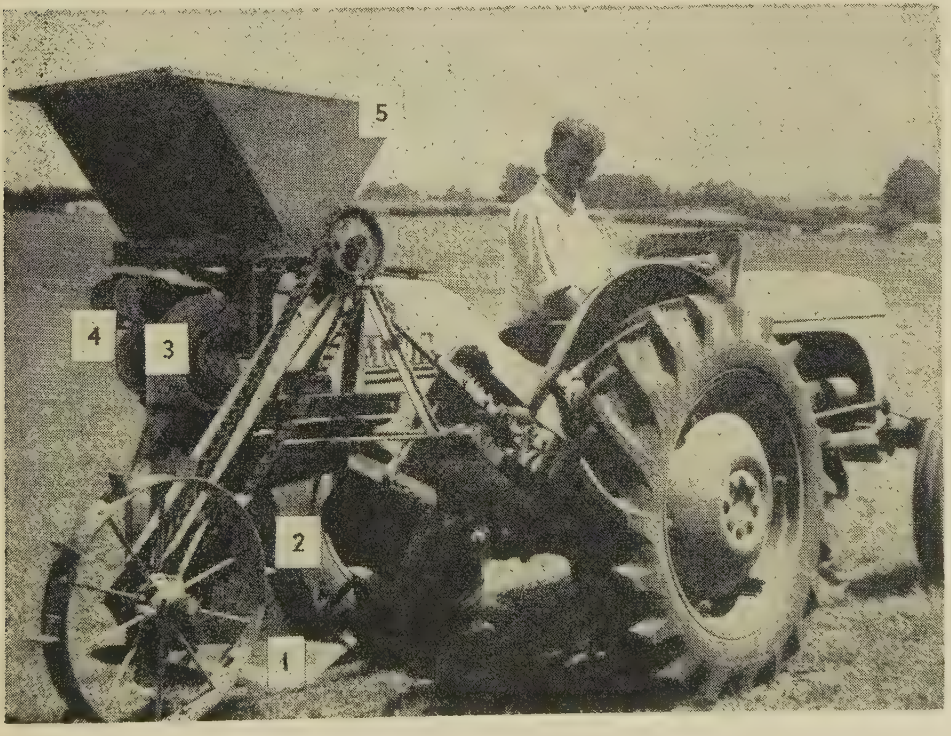
THREE placement trials were established on pastures at Rukuhia Soil Research Station to investigate:—

1. Whether the subsurface placement of phosphate below the organically rich topsoil results in reduced fixation of phosphate in an organic form and consequently increased pasture growth.

2. Whether the subsurface application encourages deep rooting, thus enabling plants to withstand drought conditions.

One measurement trial was established in August 1952 on Horotiu sandy loam. Two others laid down in May 1952 were observational trials—one on Horotiu sandy loam, the other on Hamilton clay loam. All trials were on areas where soil tests indicated low phosphorus levels. The fertilisers were placed by an implement specially designed for subsurface placement of fertiliser. It consists (see illustration below) of a triangular blade (1) supported by a stem (2) on which the blower (3), the engine (4) for driving the blower, and the hopper (5) are mounted.

Fertiliser in the hopper is activated by a worm agitator driven by a chain from a land wheel and falls into the blower. The blower, driven by the engine, ejects the fertiliser through a space in the stem into the horizontal cut made by the blade passing under the turf.



The implement used was specially designed for subsurface placement of fertilisers. (The key to the numbers is in the article.)

Trials

In the measurement trial subsurface applications of superphosphate at 4in. and 8in. were compared with wholly surface applications and half-surface and half-subsurface applications 4in. and 8in. deep. In the observational trials all subsurface applications were 6in. deep. The implement was run through plots of one treatment on all of the trials at 6in. depth without the application of fertiliser to measure its effect on production without the complicating effect of fertilisers.

Results

Yield data and observations over 2 years showed that plots receiving wholly surface dressings (with the implement run through the plots at 6in. depth), and those receiving half-surface and half-subsurface dressings at 4in. and 6in. depth were better than those with wholly subsurface dressings.

Use of the implement without fertiliser was detrimental to pasture production. This was especially apparent at the beginning of the trials, when all the control plots, on which the implement was not used, yielded markedly better than plots on which the implement was used.

A study of the distribution of the root system in different layers revealed that on Hamilton clay loam about 85 per cent. of roots are concentrated in the top 4in. layer. It is possible, therefore, that phosphate placed below 4in. may be less efficiently absorbed by pasture plants than surface-placed fertiliser. Chemical analysis of soil from a fourth trial where phosphate was placed 3in. deep indicated that such placement did not reduce the conversion of the phosphate into organic forms when compared with topdressing. Sub-surface placement in these soils thus appears not to reduce organic fixation or stimulate deep rooting, but rather to place phosphate in a position where it is less available to pasture plants.

Conclusions from the trials are:—

1. Subsurface placement of phosphatic fertilisers at 4in., 6in., and 8in. resulted in lower pasture yields than did surface placement.

2. The deeper the phosphates were placed the lower was the production.

3. Subsurface placement of phosphates did not encourage deeper rooting.

Care of Livestock during October

Contributed by the Animal Research Division

SUPPLEMENTARY FEED

SUPPLEMENTARY feed is essential for the proper feeding of cows in winter and in dry summers and to control facial eczema in autumn. As soon as more pasture is available than is necessary for the immediate needs of stock the balance should be shut up for silage or hay. On a well-managed dairy farm it should be possible to shut up at least 40 per cent. of the pasture. Crop growing for fattening of weaned lambs is standard practice in South Island districts and it could with advantage be adopted more widely in North Island districts which have dry summers. Crops such as thousand-headed kale, chou moellier, and turnips, in addition to providing excellent fattening feed for lambs, are a splendid insurance against facial eczema. In Poverty Bay and Hawke's Bay they should be sown before the end of October so that they can be well established before dry weather sets in.

MATING OF DAIRY COWS

Before each cow is mated two heat periods or an interval of at least 30 days should be allowed after calving. Cows mated before this period are less likely to get in calf, and the chances of contaminating the bull are increased. Hand-mating should be practised and accurate records kept showing the bull used and the dates of all services. Should breeding trouble occur, these records will be of considerable assistance in arriving at a correct diagnosis.

CATTLE TICK CONTROL

Where cattle ticks are plentiful spraying or dipping should be carried out in November and December to prevent tick worry and to kill the adult female ticks before they lay their eggs.

BLACK DISEASE VACCINATION

In the east coast areas of the North Island where black disease of sheep occurs vaccination should be carried out during November or early December. This will protect against the disease, which occurs mainly in summer and autumn. Vaccine should be ordered immediately.

BLOOD POISONING AFTER SHEARING

Deaths after shearing may be due to infection of cuts or bruises with the blackleg germ. This disease can be prevented by vaccinating at least 3 weeks before shearing. Sheep which have been vaccinated previously may not require revaccination, and a veterinarian or Inspector of Stock should be consulted about the best procedure.

BLACKHEAD IN POULTRY

Blackhead affects young turkeys and poultry and it can best be prevented by rearing these on land which has not been contaminated by adult poultry. If an outbreak occurs, kill all affected birds and move the remainder to clean ground. If there is a bad outbreak, the local poultry adviser should be consulted, as in some cases treatment may prove beneficial.

GREENLEG IN BROODER CHICKENS

Greenleg occurs in poorly ventilated brooders, especially if they are overcrowded and damp. At the first sign of trouble ensure that ventilation is adequate and that the litter is changed if it is at all damp.

ROUNDWORMS IN POULTRY

Infestation by roundworms is one of the most important causes of poor development of young birds. All growing stock should be treated twice with carbon tetrachloride, once at 3 months old and again at 5 months old.

BLOWFLY STRIKE IN EWES

In districts where crutch strike causes trouble in ewes crutching or early shearing is advised. Close supervision is necessary to detect cases so that suitable treatment can be applied before the strike becomes too extensive. When treating cases of fly strike shear the soiled wool away from the immediate vicinity of the strike. Dressings containing aldrin, dieldrin, or BHC will rapidly kill the maggots, which will be expelled from the wound. In addition treatment with either aldrin or dieldrin preparations will prevent restrike until dipping if this is done in January. These dressings do not prevent the flies blowing the sheep with eggs, but they do prevent the maggots from hatching and causing a strike.

Irritant fluids such as kerosene should not be used; they may kill the maggots, but they will irritate the wound and tend to cause restrike.

Jetting ewes is not usually necessary, but if fly strike is severe, it may be advisable to treat them to give protection until dipping. Apply ½ gallon of aldrin or dieldrin wash to the crutch of each animal, extending the wetted area to above and round the tail. A pump working at 40lb. to 60lb. pressure per square inch, with a hand cut-out on the nozzle, is advisable for this purpose. Jetting with aldrin or dieldrin at 0.05 per cent. will give 2 months' complete protection against crutch strike; for longer protection 0.1 per cent. should be used.

COCCIDIOSIS IN CALVES

Scouring in calves under 6 months of age is seldom due to worms; it is much more likely to be due to coccidiosis, especially if blood is present in the droppings. Effective drugs are available for treatment, but these can be obtained only on the prescription of a veterinary surgeon, who should be consulted.

Crop and Pasture Management

Seasonal Notes by the Extension Division

THOUGH spring is usually a period of abundance, it is during this time that planning for summer and autumn shortages in crop and pasture production is necessary, and the following notes deal with some aspects of preparing for summer and autumn production.

SUMMER CROPS FOR THE ECZEMA SEASON

MOST people in the North Island are now convinced of the need for a summer crop to feed off during the period of facial eczema warnings in February, March, and April. To be suitable for this period the crop must provide a large bulk of high-quality feed which will keep well, remaining in first-class condition for at least 3 months. Chou moellier, either Medium-stemmed or Giant, is one of the most reliable for this purpose. It is sown in September or October at 2lb. to 4lb. per acre, the higher rates resulting in thinner-stemmed crops, which are more suitable for sheep. In years when eczema is prevalent it can be fed off at any time during summer and autumn and will still make some recovery growth. If no eczema occurs and the crop is not required in autumn, it will keep on growing and can be used for winter feed.

SUMMER CROPS FOR DAIRY COWS

The three common varieties of soft turnips are N.Z. Green Globe, N.Z. Purple Globe, and N.Z. Red Globe, which mature about 12 weeks after sowing. These are sown in October at 1lb. of seed per acre. Because soft turnips do not keep well, it is well worth while to sow any large areas in two or three breaks if only one variety is sown. A new variety, N.Z. York Globe, matures rather earlier, about 10 weeks after sowing, and this is recommended for its better keeping quality. Because of the difference in time of maturity, it is advantageous to sow half the paddock with, say, Green Globe and the other half with York Globe.

Maize is another excellent summer crop for dairy cows in frost-free areas, particularly on swamp soils. It is sown in November in two breaks at 100lb. of seed per acre and fed off just as the cobs are forming.

—*M. G. BOYER*

* * *

SHEEP FARM PASTURE MANAGEMENT

VERY satisfactory progress is being made in many sheep farming districts, especially on hill country, in the better management and utilisation of pasture growth during the peak period from October to December. The improved management is based on the quite simple idea that it is far better to have the surplus growth in a few paddocks than scattered all over the farm, and the only way to do this is to concentrate stock to give control of peak growth while a portion of the farm is left ungrazed or lightly grazed to accumulate surplus feed for later use. It is a mistake, however, to try to hold this surplus growth until winter or even for autumn, as it will dry out in summer and become practically useless. This surplus growth should be cleaned up in December and January.

Paddocks with plenty of clover growth provide ideal feed for weaned lambs, and the more grassy ones are excellent for holding the breeding cows and bulls and the surplus sheep intended for sale later. Concentrating a good portion of the stock on this surplus grass in December and January reduces the pressure on that portion of the farm that has been kept well grazed during the peak of growth and this allows the area to recover and make some top growth before dry weather sets in. The whole farm will then be in much better condition for the trying summer and early autumn conditions than if the stock have the use of all the paddocks, and the surplus growth, mainly unpalatable species, is scattered all over the place while portions of the paddocks are badly overgrazed.

—*C. J. HAMBLYN*

* * *

EARLY IRRIGATION

WHEN soil dries out early in the season plant and animal production is likely to suffer. Early irrigation in October will often ensure greater production in November. Autumn-sown wheat crops and lucerne before the first cut usually respond to early irrigation.

—*A. D. HALL*

* * *

SPRING SOWING OF PASTURES

IN many South Island districts spring sowing of pastures provides the best opportunity for meeting all the requirements of successful establishment. Advantage can be taken of adequate soil moisture and quick-growing conditions to obtain rapid establishment of the sown grasses and clovers.

Broadcasting of pasture seed mixtures at high seeding rates, from 30lb. to 45lb. per acre, and drilling in 7in. rows, are steadily being replaced by more precise methods which ensure quicker and more uniform establishment from greatly reduced rates of seeding. Grain drills with special coulters have made possible the sowing of seed with fertiliser in 3½in. rows. More recently roller drills have been developed with special vee-section rings and with fertiliser and seed boxes mounted behind. These machines attain the ideal of placing fertiliser with the seed in well-consolidated, moist grooves at close row spacings. Seeding rates of 20lb. to 25lb. per acre sown in this way have produced excellent pastures under even adverse conditions and lighter rates may yet prove satisfactory. Rolling after sowing is usually necessary on light soils, but on heavy soils may be omitted; a mat of light plough chains attached behind the roller drill reduces the sowing and covering of seed and fertiliser to a single operation.

Such spring sowings normally result in rapid growth, and grazing within 6 to 8 weeks is often essential to control the quicker-growing ryegrasses and to ensure firm establishment of the slower-growing grasses and clovers. This early grazing, preferably for short periods at heavy stocking rates, also helps to control those weeds which have germinated in spite of adequate cultivation. However, MCPB or 2,4-DB weedkillers will control most seedling weeds without harming pasture species, and where weeds are likely to be troublesome spraying should be done as soon as the clovers reach the three-true-leaf stage. Any patches of Californian thistles in young pastures have normally been weakened by cultivation and may be controlled by spraying with MCPB or 2,4-DB before flowering.

—*S. M. J. STOCKDILL*

K-16

ANTI-CORROSIVE PAINT

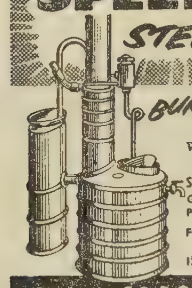
This revolutionary paint "loves" rusty surfaces, such as rusty roofs, and rusty iron and steel work of all kinds, and gives the appearance of new galvanising. One coat guaranteed good for at least five years.

K-16 Anti-Corrosive Paint is equally suited to tradesmen or amateur, to inland or seaside conditions; to home-owner or to heavy industry. Available in quarts, gallons, and 4-gallon tins. Stockists everywhere.

Distributed by:

McGILL AGENCIES
BOX 1507, WELLINGTON.
Write for leaflet.

SPEEDWAY STERILISER

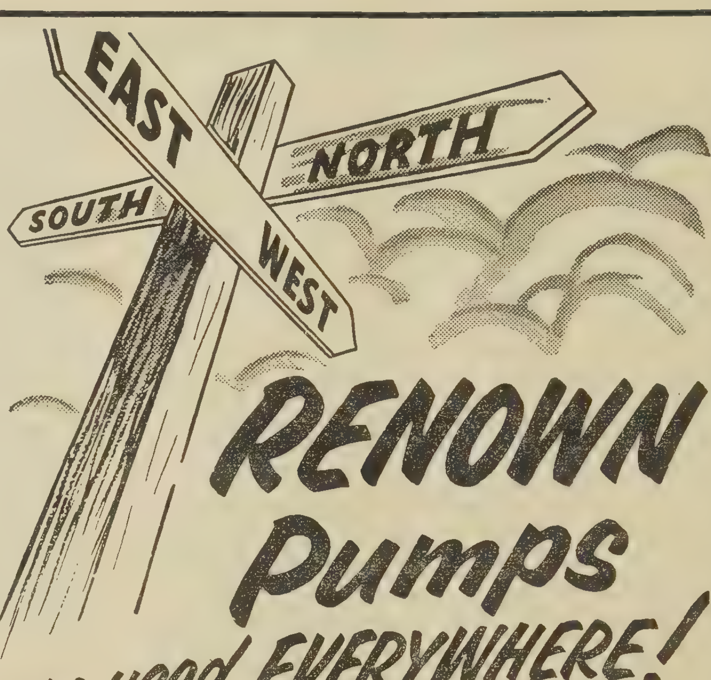


BURNS OIL OR WOOD

Write for FREE Illustrated Catalogue

SPEEDWAY PRODUCTS LTD.
GT SOUTH ROAD, PENROSE
P.O. BOX 24 *and at*
FORD BUILDINGS, COURTENAY PLACE
WELLINGTON
159 WORCESTER ST. CHRISTCHURCH

STEAM & BOILING WATER


EAST
NORTH
SOUTH
WEST

RENOWN Pumps are used EVERYWHERE!

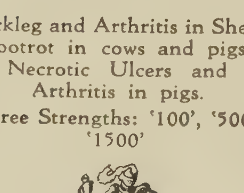
MANUFACTURED BY:— over 30,000 in daily use.

W. H. PRICE & SON LTD.
34-36 MANCHESTER ST., CH'CH. P.O. BOX 1084.

MANNINGS

PROCAL

HYPODERMIC PENICILLIN


MANNINGS PROCAL

FOR BLOODPOISONING,

Blackleg and Arthritis in Sheep,
Footrot in cows and pigs,
Necrotic Ulcers and
Arthritis in pigs.
Three Strengths: '100', '500', '1500'

4MI/P

ELTHAMOL
VETERINARY OINTMENT
A Soothing Emollient ... after milking and for ... to cracks and abrasions ...
THE COW'S TEATS
AND
THE MILKER'S HANDS
Manufactured by
N.Z. CO-OP RENNET CO. LTD.
RENCO LABORATORIES
ELTHAM N.Z.

ELTHAMOL
THE PROVEN VETERINARY OINTMENT

THE SAFE
EFFECTIVE SALVE
FOR

**CHAPS,
CRACKED TEATS
AND
BRUISED UDDERS**

Sold in 2, 10 and 36lb. tins — for economy buy the large size

Prepared under strict laboratory control by the N.Z. CO-OP. RENNET CO. LTD., ELTHAM, and obtainable from Stock and Station Agents and Dairy Factories.

Infectious Laryngotracheitis of Poultry

By R. M. SALISBURY,
Chief Diagnostic Officer, Department of Agriculture Animal Research Station, Wallaceville

INFECTIOUS laryngotracheitis (I.L.T.), a virus disease of fowls and pheasants, has been diagnosed in New Zealand for the first time. This article informs poultry farmers of the nature of the disease and the methods which may be adopted in its control.

THOUGH I.L.T. has just been proven to be present in New Zealand, there is little doubt that it has been here for a considerable time and may have been the cause of many of the so-called "colds" in pullets in autumn. These colds, commonly referred to by farmers as "roup", have been a problem on many farms and an endeavour has been made to classify them according to their causes:—

Roup

Coryza	Chronic respiratory disease	Fowl pox	Infectious laryngotracheitis
(Bacteria)	(Bacteria)	(Virus)	(Virus)

It will be seen from this that roup is a complex disease of which I.L.T. is only a member of the group; farmers must not therefore presume that if colds appear in the pullets they must have I.L.T.

Forms of the Disease Overseas

In other countries I.L.T. has been recognised to occur in five forms:—

1. **Peracute form:** This is marked by high incidence and rapid spread within a flock and accompanied by many deaths, up to 80 per cent. Affected birds gasp for air and cough frequently and there is a bloodstained discharge from the beak and nostrils.

2. **Acute type:** The percentage of affected birds in a flock is high, but the death-rate is slower and much reduced (usually 10 to 15 per cent., but it may be up to 40 per cent.). Affected birds have difficulty in breathing and cough frequently because there is an accumulation of mucus in the nasal passages. In birds which survive for a few days there may be a swelling around the eyes and a discharge from the nose.

3. **Sub-acute form:** The incidence is fairly high in affected houses, but the spread from house to house may be very limited. Affected birds have difficulty in breathing and frequently cough in an attempt to remove the caseous plugs which form at the top of the windpipe. Odd birds show a discharge from the nose and swelling around the eyes. Birds which die early in the course of the disease are usually in good condition. The death-rate is not usually very high, but the recovery rate may be slow.

4. **Chronic or mild form:** The incidence is fairly low within a flock and the birds show a swelling around the eyes and a discharge from the nose; the death-rate is usually low and those birds which die do so in poor condition.

5. **Asymptomatic type:** These birds show no symptoms whatsoever and can be recognised only by their immunity to infection when affected birds are introduced among them.

After recovery from an outbreak of I.L.T. a percentage of birds remain "carriers" of the virus and these birds are the means by which the virus survives on a farm from one season to the next.

Nature of the Disease in N.Z.

I.L.T. has been recognised here in a sub-acute form only and the spread within a flock has not been great nor has the mortality rate been particularly high. The failure to spread rapidly has probably been due to a high percentage of immune birds being present as a result of a previous infection. The incidence has been highest in the pullets and it seems that Australorps are more susceptible than White Leghorns.

The main symptom has been a gasping for air; the bird stretches its neck and opens its mouth when breathing. Affected birds often give a sharp squawk and shake their heads apparently in an attempt to remove the cheese-like plugs which form in the windpipe and obstruct the free flow of air. In the odd birds there may be some nasal discharge and a swelling of the area surrounding the eye. Death has been fairly rapid without much loss of condition.

The presence of the disease was first confirmed in birds from the Auckland area, but since then evidence has been obtained that I.L.T. has been present in most poultry keeping areas of both Islands.

Recovered birds show the presence of antibodies to the disease in their blood serum and these antibodies have been present in a high percentage of bloods examined from all districts.

The virus in New Zealand appears to be of a milder type than that which is responsible for the peracute type of disease, but there is no guarantee that it will remain this way. It might be possible at any time for the virus to become highly virulent and cause heavy losses.

The New Zealand virus has been shown to have the power of protecting birds against the more virulent strains present in Australia, and an efficient vaccine has been produced and is available for use on farms on a voluntary basis.

Control

I.L.T. vaccine should be used under the following conditions:—

1. Only on those properties where the disease is known to exist. If this is not known and the farmer has reason to suspect its existence, he should advise his local Poultry Instructor, who will be able to collect the required specimens for testing purposes.

2. When I.L.T. occurs in pullets all stock in contact should be vaccinated to bring the disease under control.

3. The best age at which to vaccinate is 8 to 10 weeks. However, where hatching is spread over 2 to 3 weeks vaccination will have to be delayed until the youngest birds have reached 6 weeks and then all growing stock will have to be vaccinated at the same time. It would be advisable to continue with this policy over the next two rearing seasons, after which there is a reasonable chance that the property will be free of the disease provided no unvaccinated adult stock are introduced, as these may be carrier birds.

4. No vaccinated birds should leave the property for 14 days after vaccination.

Initially vaccination will be carried out by Departmental officers who are familiar with the method of vaccination. The vaccine will be supplied free of cost to the farmer for the first season, but this policy will then be reviewed.

Infectious laryngotracheitis is not infective for man, and eggs from infected birds are safe for human consumption. It is also agreed that day-old chickens do not transmit the disease, so it is safe to buy chickens from properties where I.L.T. has occurred, though sellers would be well advised to use new chick boxes and clean litter in the boxes. With older birds, however, poultry farmers are strongly recommended to buy only vaccinated stock.

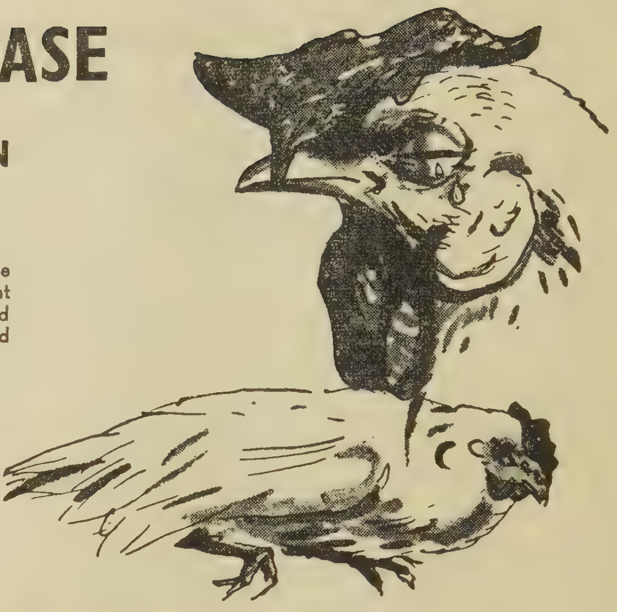
Poultry farmers should not be alarmed about the presence of infectious laryngotracheitis. It has undoubtedly been here for some time. Now that the condition has been recognised steps can be taken to combat it by vaccination procedures. Though no guarantee can be given at this stage that vaccination with I.L.T. vaccine will solve all the difficulties with regard to autumn colds, it is a fair assumption that if vaccination is carried out on those farms where I.L.T. exists, the incidence will be greatly reduced if not eliminated.

This is the first time any method of combating colds has been available; the use of the vaccine is recommended so that its importance can be assessed.

NEW POULTRY DISEASE

PREVENTION IS *WISER* THAN CURE

Symptoms of a poultry disease new to New Zealand have recently been suspected in some areas. The Department of Agriculture has the matter in hand, but the suspected disease is highly contagious and with bad coughs and colds precautionary measures are desirable.



HOW TO KEEP OUT INFECTION

The simple rule is never to bring anything into your Farm that could have been contaminated in other runs. Keep to your own egg crates for example, and above all, avoid returnable food bags. 10d. rebate on a bag that contains food for 100 hens could mean the loss of from 5 to 60 birds—from £7/10/0 to £90/0/0 in cold cash.

DON'T GAMBLE PENCE FOR POUNDS — USE

BATES MULTIWALL PAPER BAGS

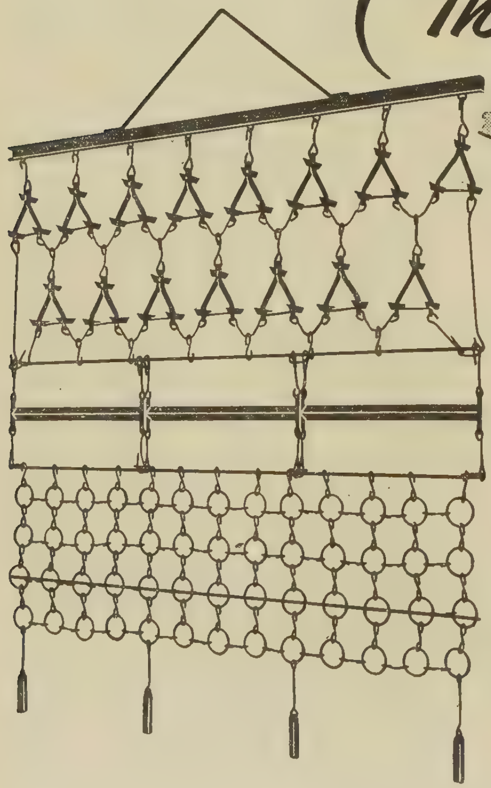
New every time — 100% hygienic — strong, handy, economical.

Further information from the Manufacturers.

Manufactured by **N.Z. FOREST PRODUCTS LIMITED** *Penrose Auckland*

They're ***WORTH MORE*** *to you*

because they **DO MORE** on your farm



8 or 10ft. models, with channel steel drawbar. Two rows of tripod and hardened teeth, one row of angle steel manure levellers, 3ft. spreading chain, and 4 dragweights.

Available in two models. The "CRUISER" giving controlled cultivation, extreme flexibility and efficient manure spreading. Ruggedly constructed. And the Wallace "HEAVY" built to do all the work of harrowing on cultivated land and tough pasture country.

Post Coupon for Details.

BUY WISELY
BUY WALLACE

MESSRS. D. McL. WALLACE LTD.,
P.O. BOX 9010, AUCKLAND.

Please send me full details of the Wallace Harrows.

NAME ....

ADDRESS ....

....

Farm Building Construction

By H. W. T. EGGERS,
Engineer, Department of Agriculture, Wellington

THE preceding five articles in this series described foundations, framing, roofing materials, sheathing, flooring, joinery, and internal finish. This article, which concludes the series, deals with new methods of building which though unconventional can help to reduce costs.

TIMBER has come to be accepted as the most versatile material for small buildings, probably because of the past abundance of suitable types. Though its versatility is not disputed, its suitability as a building material cannot be classed with that of other materials.

Timber by its nature is subject to decay and the ravages of insects and fungus and has the disadvantage of non-permanence even with maintenance. Alternative materials such as metal and cement have the advantage of permanence without maintenance if they are correctly used. For example, galvanised corrugated iron has a limited life even with maintenance by painting. The same material, however, factory treated with a bitumen asbestos compound will give what can be considered permanent service.

Even materials which can be considered permanent are subject to deterioration, but if they are correctly treated and applied, deterioration can be prevented, thereby making them as permanent as is required.

Buildings, which represent a capital outlay and an asset, should be constructed (unless designed as temporary) with materials which will give the greatest permanence with least maintenance, as once they are erected these materials will give years of useful, cost-free service.

The alternatives to timber, whether brick, stone, concrete, or metal, all give a satisfactory degree of permanence.

Construction Methods

At present what is known as frame building construction is the universal method of constructing buildings with materials other than brick, stone, concrete, or stabilised earth. With time this method has developed a definite pattern and is the method that has been described in this series.

It can be described as providing a framework to support a weatherproof sheathing consisting of roof, walls, doors, and windows, the framework plus the sheathing constituting the building.

Frames for buildings of this type in the past have been constructed almost universally from timber, with the use in larger structures of perhaps a small quantity of steel for ties.

With the enormous demands made on timber suitable for framing supplies of the accepted types are dwindling rapidly and attention has been given to the use of other materials.

As the technique of usage of any material must be decided by the physical characteristics of the material, the use of materials such as steel, prestressed concrete, foamed or lightweight concrete, etc., in building construction must involve new techniques and different construction methods.

As the sheathing materials used in timber frame construction may be termed "unit" materials, in which the fabric is built up from sheets or tiles or other small units easily handled, so other materials which in themselves may be applied as a complete fabric can also take the form of unit materials. An example of this is concrete, which can be used with reinforcing for the building of a continuous structure or in the form of concrete blocks, which are a unit material.

As some unit materials like bricks or blocks cannot be effectively bonded together to produce in themselves a rigid structure, some method of reinforcing must be applied to produce the required rigidity.

Unit materials are particularly suited to frame construction because they need not be depended on for structural rigidity, rigidity being supplied by the frame to which they are attached.

As the uses to which materials alternative to timber can be put in building construction depend on their physical characteristics, the sphere of utility or method of utilisation is varied by the range of those characteristics. Some alternative unit materials may not have the crushing strength or the rigidity to make them suitable structural units, and therefore load-bearing characteristics and rigidity must be supplied by other means, which may be a frame, reinforcing, or a combination of both.

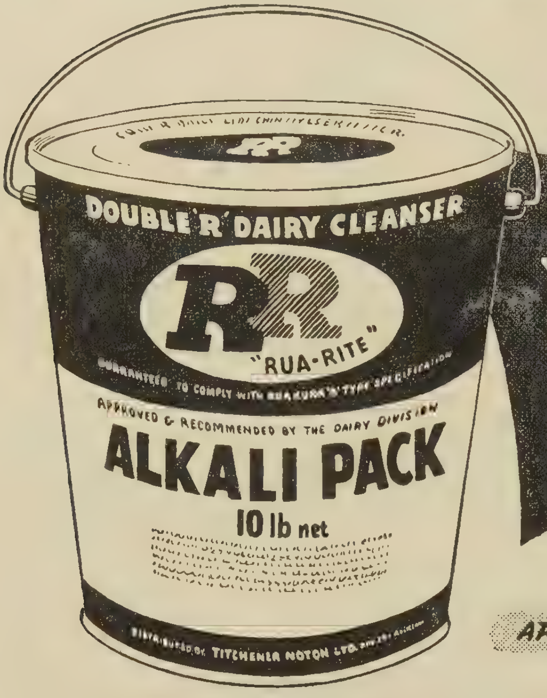
An example of this is pumice or breeze concrete blocks, which have not the necessary crushing strength to make them suitable for support walls but which can still be used as a fabric for such walls by the provision of reinforced-concrete piers and tie bands to provide the required load-carrying capacity and rigidity.

Between the two limits of true frame and continuous construction

Buildings should be constructed with materials which will give greatest permanence with least maintenance. This implement and storage shed was built of foamed concrete units by 4 men in 8 days on a site 230 miles from the factory supplying the units. The cost was 10s. per square foot.

8 out of 10

N.Z. FARMERS
USE


DOUBLE 'R' DAIRY CLEANSER
RR
"RUA-RITE"
GUARANTEED TO COMPLY WITH RUAKURA'S TYPE SPECIFICATION
APPROVED & RECOMMENDED BY THE DAIRY DIVISION
ALKALI PACK
10 lb net
DISTRIBUTED BY TITCHENER NOTON LTD.

QUICK ACTING

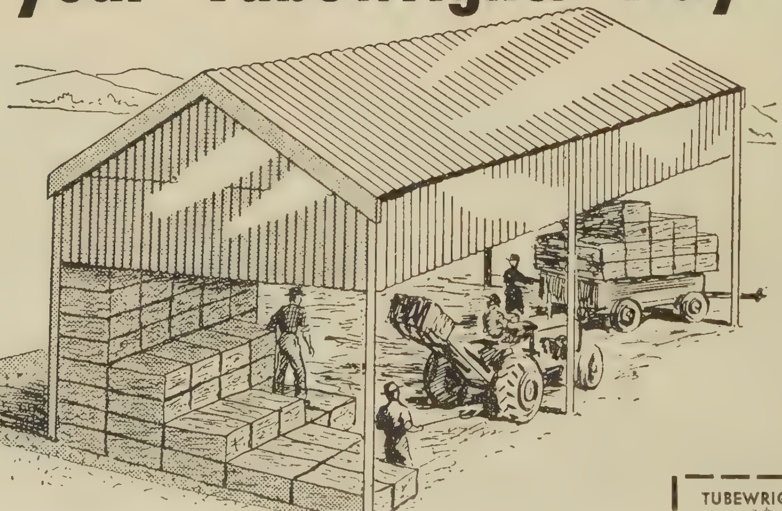
DOUBLE 'R'
DAIRY CLEANSER

. . . because New Zealand's farmers have prove "Double R" is a superior cleanser and an enemy of harmful bacteria. "Double R" prevents accumulation of milk stone, maintains your machine at an unprecedented degree of cleanliness and directly helps to keep your butterfat grading at the highest, yes, and the most profitable level.

APPROVED & RECOMMENDED BY THE DAIRY DIVISION

Guaranteed to comply with Ruakura "B" Type Specification.

Farmers—now is the time to order your Tubewrights Hay Barn!



TUBEWRIGHTS BARNS are engineered by skilled tradesmen with jigged production ensuring accuracy of dimensions — no trouble with bolt holes that don't fit! Tubewrights barns are quick and easy to erect and are competitively priced. Designed in standard sizes to store approximately 600 bales of hay per bay and may be extended to any number of bays.

TUBEWRIGHTS OF NEW ZEALAND LTD.
P.O. Box 151, Lower Hutt. Phone 67-662, Wellington

TUBEWRIGHTS of NEW ZEALAND LTD., P.O. BOX 151,
Lower Hutt.
Please send me a quotation for a .... bay hay barn.
NAME ....
ADDRESS ....
....

there is a wide field of methods of construction all of which are suited to the particular materials being used. These methods may embody some principles of each type of construction in varying proportions according to requirements as shown in the description of light-weight concrete construction later in this article.

Steel Framing Materials

The quest for alternative materials to timber has produced systems of building frame construction using steel either in industrial sections or as tubes.

Industrial sections are fabricated into a type of truss which can be used as a universal member for either roof or walls. Steel tubes are used for columns, trusses, and purlins, being joined with special fittings in which grub screws are used for fastening.

Firms offering steel-frame buildings can provide for hay barns, implement sheds, grain stores, manure stores, garage workshops, and livestock shelters.

The buildings can be supplied as a kit set, which includes all-steel members, timber members where used, all external sheathing, windows and doors, and all nails and bolts necessary for the farmer to construct the building himself.

Alternatively steel work only can be supplied all ready for bolting together, the purchaser providing all woodwork and sheathing.

Alternatively steel work for roof only can be supplied, the purchaser providing the remainder of the structure, or the structure can be erected by the suppliers complete if the farmer so desires.

All firms offer their structures sectionalised so that initial structures can be extended by the addition of more bays.

One firm offers a standard framework which allows for future partial or complete covering in and fitting of doors, which enables the user to salvage or purchase his coverings piecemeal and fit as he so desires, thus reducing the initial outlay required for a partial or totally closed-in building.

As all-steel-frame buildings are sectionalised, sizes must conform to a pattern decided by the manufacturers. One firm can supply a 20ft.-wide building with a 12ft. stud in multiples in length of 10ft. from 20ft. to 60ft. Another can supply implement sheds 15ft., 16ft. 6in., 18ft. 4in., 20ft., 21ft. 10in., 23ft., 25ft., 27ft., and 30ft. long by 15ft. wide, all sizes having an 8ft., 9ft., 10ft., 11ft., or 12ft. stud. Hay barns are available 30ft., 45ft., and 60ft. long by 20ft. wide; 45ft., 60ft., and 75ft. long by 25ft. wide; 45ft., 60ft., and 75ft. long by 30ft. wide, all sizes having 12ft., 14ft., or 16ft. stud height. These hay barns can accommodate 900 to 4500 bales of hay according to their size.

The cost of these buildings naturally varies with the amount of materials and labour provided by the suppliers; for example, an implement shed open in the front, 45ft. by 20ft. with a 10ft. stud, is available as follows:—

	£	s.	d.
Basic price—1 bay of 15ft.	105	0	0
+ 2 bays of 15ft. at £49	98	0	0
	203	0	0
Timber if supplied	42	10	0
Corrugated iron if supplied	126	0	0
Spouting, ridging, and down pipe	11	12	0
Total	383	2	0

or approximately 8s. 6d. per sq. ft. of floor area.

Similarly a 40ft. by 20ft. shed with 12ft. stud can be obtained complete with sliding doors for £640, or the steel framework only can be purchased for £316 12s. This shed complete is approximately 16s. per square foot.

For buildings with steel as a substitute for timber as a framing material the choice and cost will depend entirely on individual requirements and the amount of material bought as against materials salvaged.

Steel trusses are also available for bridge construction for spans from 8ft. to 20ft. with a width of 10ft. and track width of 8ft. 6in. The decking for these bridges (which is not supplied) is 9in. by 4in. hardwood at 1in. spacing. These bridges will carry a load of 12 tons and cost approximately £6 13s. 6d. per foot.

Tubular steel with the fittings mentioned previously for junctions can be used for fences, gates, holding pens, bull yokes, or for any other application where a strong permanent structure is required.

Wherever steel buildings are required choice should be made only after consideration of all equipment available, as some types may be more suited to individual requirements and purse than others.

Pre-stressed Concrete

Pre-stressed concrete is a new material for building construction and can replace timber for any beam members such as floor joists.

It is essentially a factory product and is made by reinforcing uniform concrete with steel wires tensioned with special equipment. This places the concrete under compression and as its compressive strength is its greatest characteristic, less mass of concrete can be used to produce beams of equivalent strength to similar beams reinforced by normal methods. The total weight of reinforcing is also reduced.

Pre-stressed concrete floor joists can be used in three ways to give composite floor construction.

Pre-stressed joists and blocks: Light pre-stressed joists with infilling blocks of pre-cast hollow concrete or terracotta are bonded and covered with an infill of screed concrete. The joists require projecting stirrups to bond the infill and screed concrete to produce T beam action. No shuttering is required for this floor.

Pre-stressed joists and in situ slab: Pre-stressed joists are placed at calculated spacing and a reinforced slab cast over them. The slab shuttering is supported by timber spreaders placed between the joists.

Pre-stressed joists and slabs: Pre-stressed joists are placed and pre-cast (light-weight) slabs placed over them. The whole is tied together as a monolithic floor by stirrups or joists and a screed concrete covering. No shuttering is required.

Light-weight Concrete

Concrete used as a unit material for building construction either as blocks or slabs has a disadvantage in its weight. Solid unit members cannot be made in convenient sizes because of weight, and attention has therefore been given to producing a lighter material without sacrificing any necessary qualities of strength.

Units such as blocks are produced with cavities, and natural, light-weight aggregates are used for making slabs and blocks. Concrete is produced less dense in structure and containing air cells by eliminating the fine aggregate (no fines concrete), by air entraining, or by foaming. Any alteration in these ways to the structure of normal concrete naturally alters its physical characteristics. The inclusion of air in the structure while reducing the crushing strength increases the thermal insulating properties of the material. Average normal concrete has a density of approximately 150lb. per cub. ft. If this density is reduced to 70lb. by air entrainment, the heat-insulating properties are increased nearly four times.

This treatment of concrete, though partially sacrificing some properties, is also providing other properties which are valuable for building construction, and it is on the degree in which some properties can be sacrificed to gain the advantage of others that the successful application of light-weight concrete as a unit material has up to the present depended.

The theory of foaming or air entraining concrete is to permeate a dense material with minute bubbles of gas or air not only to reduce weight but to give better insulation properties.

These processes must be controlled and are therefore particularly suited to factory production of unit materials.

PLENTY OF FEED IN DRY WEATHER

WHEN YOU INSTALL
BISLEY-AMES
IRRIGATION

PLAN FOR
PRODUCTION NOW

- INCREASE CROP YIELDS and IMPROVE PASTURES
- MAKE THE MOST OF AVAILABLE WATER and *SAVE LABOUR*

ACT NOW! IT'S LATER THAN YOU THINK

BISLEY-AMES have brought the latest Overseas Developments in SPRAY IRRIGATION to N.Z. Large areas can now be irrigated profitably with a minimum of labour and expense. Enquire for details of Bisley-Ames mechanical move and Tow a line systems.

TAKES THE WORRY OUT OF FARMING

A. M. BISLEY & CO. LTD.
Ward Street, Hamilton — Antigua Street, Christchurch

A. M. Bisley & Co. Ltd.,
P.O. Box 487, Hamilton.
Please send me details of Bisley-Ames Irrigation.
NAME ....
ADDRESS ....
.... J.A.

Branches at TE AWAMUTU, MORRINSVILLE, TE PUKE, WHAKATANE and TIMARU.
DISTRIBUTORS IN ALL MAIN TOWNS.

← *POST THIS HANDY REPLY.*

The Revolutionary PRESSURE-LOCKING
AMES BALL COUPLER
MAKES FIELD CONNECTIONS AS EASY AS ABC!

Revolutionary!!
GARDENMASTER
the Landmaster for HOME gardeners!

Never before has so small a machine offered such big advantages—heavy soil turning, deep or light digging, row cultivating, weeding—all so effortless . . . Quick too! Try it! Buy it! Gardenmaster by Landmaster!
. . . and for larger gardens, the familiar

Landmaster

5 models up to 10 h.p. Life's a lot easier with a Landmaster!

N.Z. Distributors:

IBL Ivory Bros. Ltd.

P.O. Box 1321, WELLINGTON and at AUCKLAND
There's an Agent in your area for sales and service.

Apart from the use of natural light-weight aggregates the first attempts to produce light-weight concrete artificially were directed along these lines.

With the introduction of artificial light-weight aggregates such as perlite and vermiculite the theory has changed to virtually foaming the aggregate instead of the concrete. This change of technique produces an aggregate suitable for the making of light-weight concrete by normal methods as used by the farmer or anyone making concrete by semi-controlled methods.

With air-entrained or foamed concrete a balance must be struck between required strength and insulation properties, the density and relative strength being varied by the degree of foaming or air entrainment given. Under these conditions water, foaming additive, cement, and sand ratios and mixing times are critical to produce a concrete of any particular density and must be closely controlled for each batch or mix to ensure no variation between mixes.

Light-weight aggregates, being foamed in themselves, can be produced in densities regulated by the gases given off by chemical reaction during the calcining process. This differs with the raw materials used. Some minerals when treated become virtually a mass of tiny bubbles giving an extremely light aggregate; others have varying degrees of air impregnation which will produce concrete of corresponding densities.

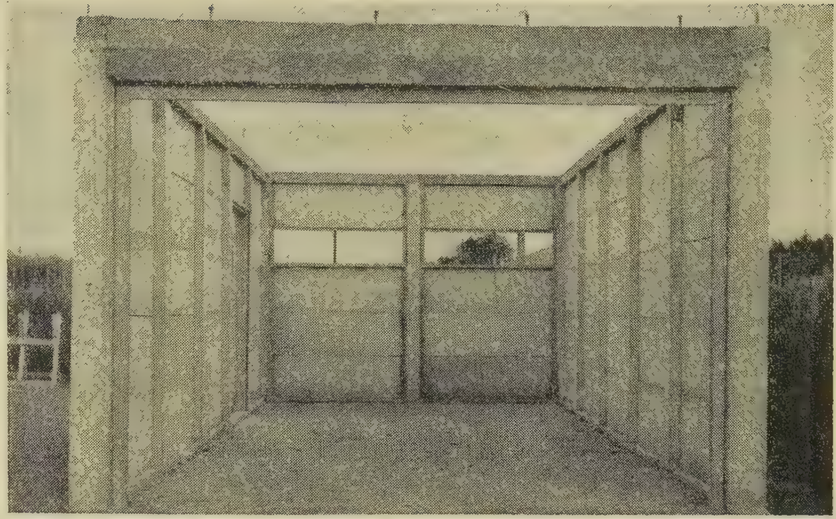
With the very light, highly bubbled aggregates concrete density can be controlled by mix proportions; for example, with one particular aggregate a mix of 1 part of aggregate with 1 part of cement produces concrete of a density of 84lb. per cub. ft., whereas a mix of 8 parts of aggregate with 1 part of cement produces concrete of 21lb. density.

The density of concrete produced with aggregates having more of an air-entrained nature than bubble formation, though depending on the density of the particular aggregate used, can be varied to some extent by grading the aggregate. Generally the larger is the aggregate the less dense the resultant concrete.

Foamed Concrete

As foamed concrete lends itself to factory production, unit building materials can be factory produced. If these are designed for simplicity of erection, they give a satisfactory building from permanent materials.

A method of using foamed concrete units for building construction is shown in the illustrations in this article of an implement and storage shed and a garage.



A garage being built with reinforced panels and piers of foamed concrete. The reinforced concrete top band, piers, and foundation give rigidity and support to the panels.

The construction to top plate level is carried out in piers and panels. The strength and rigidity sacrificed in producing a light-weight panel are regained in the piers and reinforced-concrete top band. Both piers and panels are pre-cast in foamed concrete of a density of 90lb. per cub. ft. Grooves are provided in the piers into which the stepped edge panels fit. Both piers and panels are reinforced, the pier reinforcing being bonded into the foundation and top band reinforcing, thus producing a rigid structure. The foundation, piers, and top band provide the rigidity and support for the panels.

Being factory produced this unit building material requires very little labour for erection and can be produced quite cheaply. For example, the implement shed shown was erected complete with roof and guttering by 4 men in 8 days, 230 miles from the factory, at a total cost of 10s. per square foot, which compares more than favourably with the 8s. 6d. per square foot for the bare implement shed with steel frame mentioned earlier and which had a non-permanent sheathing in place of this permanent material.

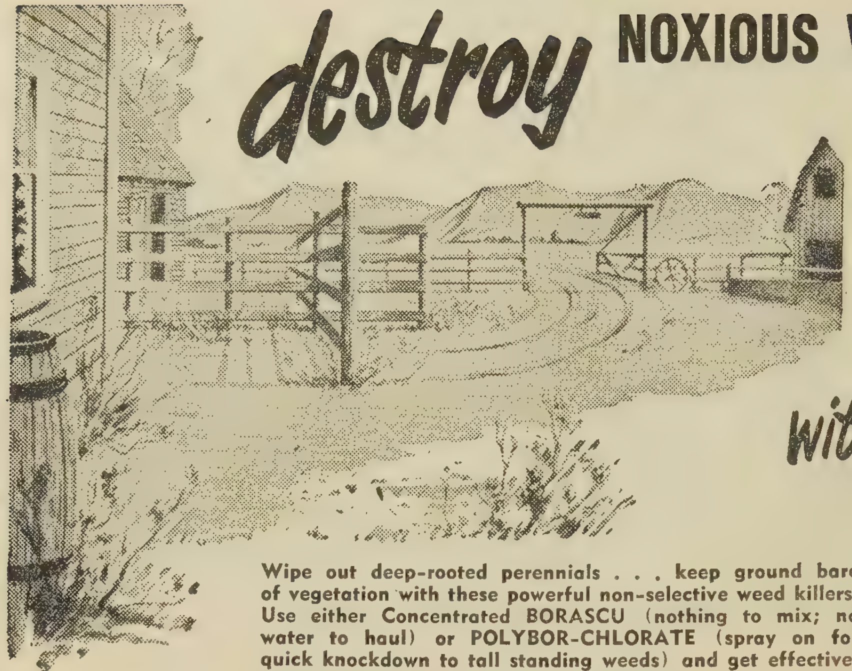
Plastic Sealing Compounds

The conventional practice of sealing joints in sheathing members such as glass to window frames, butts in weather boarding, etc., against the elements is to use a putty or bituminous preparation which hardens with time. Ordinary putty composed of whiting and oil becomes rock hard in time and quickly cracks with repeated expansion and contraction. Even bitumen-based preparations harden out to become unserviceable. So-called non-hardening putties also harden in time, but take considerably longer than ordinary putty.

As nearly all structural joints are subject to working through several causes, any putty which sets hard is not a suitable medium with which to seal such joints. With the advent of plastics putties have been produced which will not harden with age. These putties skin on the outside and can be painted over, but retain a permanently soft core which gives them flexibility. For this reason they are not suitable for sealing in places where the putty cannot be given some volume; for example, if used for stopping gaps or cracks up to ⅛in. wide, they will skin right through and become useless as a sealer. Where, however, they can be used in grooves say ¼in. wide or as a fillet for sealing in corners such as glass in window frames, the skinning effect cannot penetrate right through and the soft, flexible core is retained.

Plastic sealers of this nature which are specially designed to seal moving joints permanently and satisfactorily are available in different types each particularly suited to certain applications. There are types for sealing cracks in concrete water tanks and joints in concrete slabs; there is a type which can be readily moulded into special jointing shapes for pipe flanges and other joints, and there is a type which can be used for all sealing purposes where ordinary putty can be used, provided it is given volume. This latter type is marketed in a form suitable for application by hand gun, which greatly simplifies its application, as fillets can be run or grooves sealed with an even disposition of material by simply operating the gun. Possession and use of one of these sealing guns constantly bring to light new uses for this material such as the sealing of joints in replacement guttering, which is normally a difficult job, as the guttering is under the overhang of the roofing.

These guns are not expensive and are an excellent means of applying the



destroy NOXIOUS WEEDS and unwanted GRASSES!

- in drainage and irrigation ditches
- along fence lines
- round farm buildings
- in pens and yards.

with

CONCENTRATED
BORASCU®
FOR DRY APPLICATION

POLYBOR-CHLORATE®
FOR SPRAY APPLICATION

Wipe out deep-rooted perennials . . . keep ground bare of vegetation with these powerful non-selective weed killers. Use either Concentrated BORASCU (nothing to mix; no water to haul) or POLYBOR-CHLORATE (spray on for quick knockdown to tall standing weeds) and get effective, long-lasting results. Both are non-poisonous . . . non-toxic to livestock.

Regd.
20 MULE TEAM
— Brand

R

BORAX CONSOLIDATED LIMITED.

For fuller information and for name of your nearest dealer write to F. T. Winters,
C.P.O. Box 3433, Auckland.

BZ.201

Get FULL VALUE from Your Home Grown FODDER!

If you are not using a Hammer Mill YOU ARE WASTING GOOD STOCK FOOD — food that cost you time and money to produce. Hay is being trampled into the ground, grain is not digested, stock are not thriving as they should.

You can ELIMINATE THIS WASTE
by grinding the foodstuff and feeding in meal form.

BALTIC SIMPLEX HAMMER MILL

is the MODERN MACHINE for this purpose

There is a model to suit every farm with power requirements ranging from 3 H.P. to 30 H.P. or more.

Grain and Hay may be ground together — you can blend your own concentrates quickly and cheaply.

APPROXIMATE HOURLY CAPACITY:

Wheat	Up to 6,000 lbs.	Maize Cobs	2,500 lbs.
Barley	" " 6,000 "	Oaten Hay	3,000 "
Oats	" " 4,000 "	Baled Lucerne Hay	4,500 "

Write for further particulars to —

FARM EQUIPMENT CO. LTD., BOX 275, WANGANUI

or to the Manufacturers

BALTIC SIMPLEX MACHINERY CO. LTD.
HALL STREET, SPOTSWOOD, VICTORIA, AUSTRALIA

sealing compound, being very easily handled. The sealer is available in cellulose-wrapped cartridges which are placed in the gun for use. After use the cellulose wrapper is extracted from the gun, in which another cartridge can be placed.

One big advantage in using a gun for the application of this sealing compound is that there is no loss of compound with intermittent use. The gun can be put away after use for an indefinite period with no deterioration of any compound left in it. When it is taken out and used again a small quantity of compound is wiped away from the nozzle and the gun is ready for immediate use.

Waterproofing Compounds

Building materials such as brick, stone, or concrete, being of granular construction, have hygroscopic characteristics and can absorb and retain moisture. It is this fact, together with atmospheric conditions and the presence of micro-organisms, which produces the ageing of construction materials.

The atmosphere with its variation of temperature and pressure and variable pollutions according to geographical localities can lead to sulphurations (in towns) or chlorinations (near the sea) and erosion by wind and rain. Micro-organisms by transforming insoluble salts into soluble ones permit moisture to draw these salts to the exterior surfaces and their crystallisation leads to the formation of blooms, with consequent disintegration of the granular structure.

If the entry of moisture to these materials by capillary action could be prevented, erosion and destruction by ageing would be considerably reduced. This can be accomplished by two methods. The first consists of disposing a continuous coat on the surface of the material to produce a mechanical dam. The efficiency of this method is subject to its resistance against wear and the permanence of the coating material used. The second method consists of treating the surface of the material to suppress the mutually attractive actions of the material and water.

The granular structure of these materials entrains a volume of air which is subject to expansion and contraction with changes of temperature, causing respiration of the material. The sealing of the surface with a mechanical dam also seals in the entrained air and prevents respiration. This can cause a pressure differential between the entrained air and the outside atmosphere, resulting in the lifting of the surface membrane.

Treatment of the surface of the material to suppress capillary action of moisture does not seal the surface in such a manner as to prevent respiration. The material can still breathe and retain an internal and external equilibrium.

Synthetic resins are available in solution which when applied to these materials by brush or spray coat the granular structure with a thin waterproofing coating which makes the grains shed water but does not make the surface impermeable. This coating is carried to a depth of a few millimetres, depending on the density of the material. It does not change the colour of the surface, is invisible to the naked eye, and can be detected only by the action of water on the treated surfaces.

The solutions are procurable in two types, one with a spirit base which is suitable for all normal dense materials and one with a water base which is suitable for less dense materials such as concrete made from light-weight aggregates. If a spirit-base solution were used on materials with relatively high absorbent properties, deep penetration would occur, with consequent dispersal of the water-repellent film. For this reason a water-based solution should be used on absorbent surfaces.

Cutting Silage with a Chainsaw

By D. F. SCOTT,
Machinery Instructor, Department of Agriculture, Auckland

EARLIER attempts to cut silage in either a pit or a stack with a chainsaw were largely unsuccessful owing to the silage jamming in and around the chain and sprocket. In these attempts saws were used with chain speeds of about 1200ft. per minute or less.

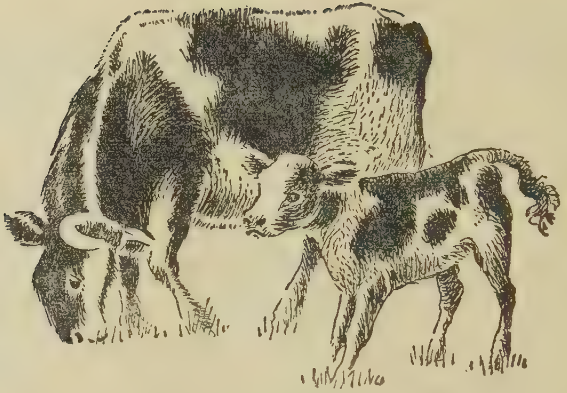
In recent trials near Auckland with a small chainsaw with a 17in. blade and a chain speed of 3300ft. per minute it was possible to make a cut about 12in. deep across a pit 20ft. wide in about a minute. The saw required one minor alteration to a shield, and this completely eliminated blocking without reducing the safety of the machine. It was also found advisable to remove the spiked bumper.

The type of chain tooth used in this saw is that used on most saws sold for general use and is known as the chipper tooth. This tooth can be readily sharpened by unskilled operators. The only other common tooth in use is the planer or chisel tooth, which is used only by timber workers cutting hardwood and requires servicing by an expert. This tooth is unsuitable for general farm use and would very likely block on silage.

In regular feeding out it appears that the most satisfactory system would be to spend 5 to 10 minutes cutting silage into blocks about 2ft. 6in. square and 10in. to 12in. deep. Forking is then much easier and the silage can be loaded on to the trailer in easily handled lumps. After use the saw is allowed to cool, washed with a hose, and run briefly to spread oil round the chain. The saw is immediately usable for its normal duties of cutting wood.

Dairy farmers . . .

mastitis is most prevalent immediately after calving and during the spring months. Protect your herd at these times with



Vetspen

Trade Mark

Cerate

PENICILLIN UDDER INJECTION

VETSPEN CERATE
is available in four strengths—'25', '50', '100' and '500'. Each strength is available in handy, flat, colour-coded tins containing 12 tubes.

* **STREPTOPEN CERATE**
is now available, from your usual farm supplier, for those cases of mastitis which have proved resistent to adequate dosage with penicillin.

GLAXO LABORATORIES (N.Z.) LTD., PALMERSTON NORTH

GLAXO

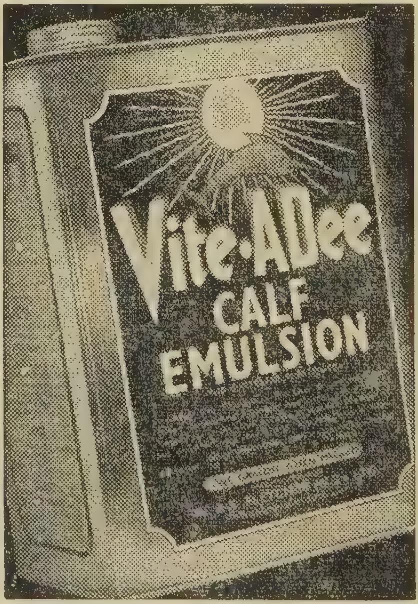
WOLSELEY

CONTROLLED GRAZING can mean 25% MORE MILK PER ACRE!

For full particulars, consult your nearest branch of —

Dalgety

AND COMPANY LIMITED
(Incorporated in England)



AVOID NUTRITIONAL SCOURING

- Feeding Vite-ADee *avoids* scours, because the vitamins of Calf Emulsion replace the butter-fat vitamins which the calf loses as soon as it is put on to skim. As you know, it is the sudden withdrawal of Vitamins A and D which so often brings on scours. Vite-ADee Calf Emulsion spreads, with a quick stir, right through the skim or whey . . . and only one teaspoon per day is needed to give each calf a sound start towards healthy future production.

. . . use

VITE-ADEE CALF EMULSION

For further information write to

W. & R. FLETCHER (N.Z.) LTD., P.O. BOX 594, WELLINGTON.

G.7356

Crops for Winter Feeding of Pigs

FARMERS who intend to grow crops for feeding to their pigs next winter should be making preparations now for getting these crops in. In this article I. H. Owtram, Extension Officer in Pig Husbandry, Department of Agriculture, Wellington, deals with some aspects of this, with particular reference to maize.

THE winter of 1957 is now past, but is still sufficiently recent for memories of the problem of feeding pigs during that time to be fresh, particularly memories of the cost of buying meal. It is much cheaper and not really very difficult to grow the necessary feed on the farm, and as a crop to reduce the meal bill maize deserves far more attention than it receives at present.

Benefits of Maize

Maize can be grown satisfactorily as a grain crop for pigs over a very wide area of the North Island, and its yield per acre is such that it shows a very good return in feed produced. The area that need be grown is not large, and on nearly all dairy farms where pigs are kept there are pig paddocks that have been used for pigs for a considerable period and in which there is high latent fertility which has been built up by the pigs themselves. One of these paddocks would be entirely suitable for a crop of maize, and the labour of putting it in would not be very great.

Maize is an excellent feed for pigs.

Pfister 360 double hybrid maize.

Grains of Wisconsin 643 maize.

Because of their superiority in yield and in resistance to bad weather these two varieties should be used in preference to all other varieties.

Feeding Maize

A prevalent idea is that one of the great drawbacks to maize is the labour required to harvest it. When the crop is grown for feeding to pigs in a handy paddock harvesting labour can be almost entirely eliminated by allowing the pigs to do the harvesting themselves.

If an electric fence is used to break-feed the maize, it can be fed in this way economically and without waste. If a root crop such as fodder beet is grown as well alongside the maize, the electric fence can be used to give the pigs a portion of each crop simultaneously. When the electric fence is erected a track for it about 3ft. wide should be cut through the maize. If the maize is planted in a long and fairly narrow strip, this is not a very big undertaking.

The pigs should not be allowed free access to the crop for 24 hours a day, but should be put on to it for 4 to 6 hours daily.

The area used in each break depends on the number of pigs to be fed and on how often their owner is prepared

"Paint it with

LUSTAR

and you'll double its life!"

That goes for gates, yards, fences, buildings, trailers, implements, silos, horse-, cow-, and stack covers, tarpaulins, etc., etc.

Since first marketed in 1944, Lustar has made firm friends all over New Zealand, because of its simplicity in use, and reliable performance. Lustar Improved Tar-Base Paint is equally good for metals, timbers (including pinus), or fabrics. In black only: Gallons 25/-, 4-gallons 80/-, 45-gallon drums (railage free) £30.

Order from your Stock Firm or
Hardware Dealer.

N.Z. Distributors:
McGILL AGENCIES, Box 1507, Wellington.

Government Publications

GRASSLANDS OF NEW ZEALAND

By Sir E. Bruce Levy.
322 pages, illustrated. Price 26/6 Post free

PLANT PROTECTION IN NEW ZEALAND

A comprehensive guide for professional growers, students, and home gardeners.
700 pages, illustrated. Price 56/- Post free

ARABLE FARM CROPS OF NEW ZEALAND

By J. W. Hadfield.
332 pages, illustrated. Price 28/6 Post free

Obtainable from:
The Government Printer,
Lambton Quay, Wellington, and
130 Oxford Terrace (P.O. Box 1721),
Christchurch.

CROWN BRAND
STOCK REMEDIES

MONEKIL "S"

Sheep Worm Remedy

Sole N.Z. Agents
MACDERMOTT & DUNCAN LTD.
Box 624, Wellington

The Super 66 — America's most popular baler — builds bales from 12" to 52".

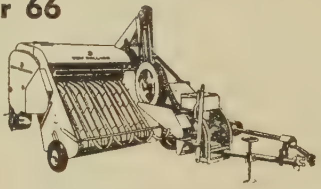
Get the bales you want every time

with a super 66

Whatever the weight you want to handle . . . whatever your crop . . . wherever you farm—the bales you build with a New Holland Super 66 are alike in density and size. This applies to bales all the way from a foot long to 52 inches.

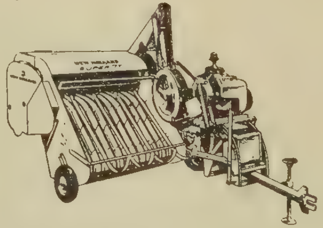
It's the new *Metermatic* bale control that makes this possible. With a quick setting of the measuring arm you build the *exact* bale you want. Every bale is firm. And because each bale is measured from 'zero," you get better uniformity than ever before. Good, square bales just right for stacking.

Engine-powered or power-take-off model, the Super 66 bales up to 9 tons an hour. New Holland Machine Co., a subsidiary of Sperry Rand Corp., New Holland, Pennsylvania, U.S.A.



Super 77 World's fastest baler

Combines high capacity — up to 12 tons an hour — with unusual ability to keep working day after day all season long. You get richer harvests because the "77" bales quickly and dependably when the crop is at its prime. Available in engine-powered and power-take-off models.



Model 87 Favourite of wire-tie balers

For the farmer who wants bales tied with wire, the "87" turns out uniform bales — from 60 to 125 pounds — securely tied with New Holland's exclusive "In-Line" twist. Engine-powered or power-take-off models, capacity is up to 12 tons an hour.

NEW HOLLAND
"First in Grassland Farming"

FREE CATALOGS! For free catalogs on New Holland's balers, write: Doring Implement Distributors, P.O. Box 1179, Wellington, C.1, New Zealand.

Name ....

Complete Address ....

.... NH-4

Pigs feeding on maize, which can be grown satisfactorily as a grain crop for pigs over a very wide area of the North Island.

to move the electric fence. The smaller the area is, the more efficiently the pigs will clean up the maize. The use of what are known as double hybrid varieties has greatly increased the yield per acre, and a crop of 80 to 100 bushels per acre can confidently be expected.

Two to 2½ bushels of maize are required for each pig wintered, and feeding should be at the rate of about 1lb. to 1½lb. per day. From this it can be seen that an area of maize as small as ½ acre can be extremely useful to the average pig producer, particularly if it is combined with an acre of fodder beet. The crop of maize obtained will be equal to at least 1 ton of bought meal and probably more, provided proper care is given to its cultivation.

Varieties of Maize

The variety of maize used is important. Two double hybrid varieties are available, namely Pfister 360 and Wisconsin 643, and their superiority in yield and in resistance to bad weather is such that they should be used in preference to all other varieties. Certified seed of both these double hybrids is obtainable through seed merchants. In the maize-growing districts on the east coast of the North Island they are used extensively, and yields as high as 120 bushels per acre are not uncommon, and much higher yields than this have been obtained.

Preparation of Seed-bed

Comprehensive details regarding the growing of maize for grain are given in Departmental Bulletin No. 269, "Maize Growing for Grain", and the reader is referred to this bulletin. However, the following brief details of the cultivation, sowing, and manuring of maize will be of assistance.

A good seed-bed is essential and time spent on this is never wasted and always results in a better crop. The area should be ploughed, disced, and harrowed so that a fine, firm seed-bed is prepared by the time the seed is to be sown. Small areas can be satisfactorily worked up with a small rotary hoe.

Sowing

Maize should be sown from October to mid-November, but sowing must be governed by the weather, as cold, wet soil will reduce germination and crops sown under such conditions will not mature earlier than crops sown later when soil warmth and moisture are correct.

The rate of sowing should be from 12lb. to 18lb. per acre and the seed should be sown in rows 30in. to 36in. apart. The use of a maize planter for a small area such as would be grown for pigs is hardly practical, unless such a machine can be borrowed. A small hand machine is quite satisfactory for planting, or the seed can be dibbled in by hand after the paddock has been marked by a sledge with runners 3ft. apart being drawn across it to form parallel lines.

In most districts some fertiliser is necessary to give maximum results and a dressing of 2cwt. of superphosphate and 4cwt. of blood and bone manure per acre is recommended. If the maize is being grown in a paddock in which pigs have been running for some time, it is extremely unlikely that there will be any shortage of nitrogen.

Maize normally takes 10 to 14 days to come through the ground, and as weed seedlings germinate much more quickly, the ground should be harrowed parallel to the rows about 8 days after sowing. As soon as the maize seedlings are above the ground it should be harrowed again lightly.

Weed Control

After this second harrowing weeds can be controlled by spraying and this should be done as soon as the weeds are again above the ground. The earlier the weeds are sprayed the more efficient will be the kill and the less likelihood there will be of damage to the maize plants. The amine salt of 2,4-D is recommended for spraying. The rate of application depends on the size of the weeds and growing conditions during the season. If the season is moist and growth rapid, rates as low as ½lb. acid equivalent per acre will effect a good kill, but if the topsoil is dry and weed growth slow, as much as ¾lb. to 1lb. will be required.

A combination of maize and fodder beet fed out in breaks with the aid of an electric fence is an ideal way of providing feed for pigs in those three awkward months of winter. This method deserves considerably more attention than it is receiving at present, particularly from farmers in the northern half of the North Island. The majority of dairy farms in that area have a patch of land somewhere suitable for growing it and the use of one or more of the pig paddocks for this purpose would enable the farmer to profit from the fertility the pigs have built up.

SPEEDWAY

LOW & HIGH PRESSURE

OIL BURNING BOILERS

Write for FREE Illustrated Catalogue

SPEEDWAY PRODUCTS LTD.
GT. SOUTH RD., PENROSE, P.O. BOX 24

Branches at
Ford Bldg. Courtenay Place, Wellington
139 Worcester Street, Christchurch

Better Health means Better Production

Vite ADee

is the 3 best Poultry Oil for the purpose

Beat Fly Strike Early
WITH
COOPER'S DIELTOX 20
(Containing DIELDRIN)

Ensure the maximum protection against strike on sheep and lambs with this highly effective remedy.

Hindquarters treatment of lambs at docking gives crutch control for a minimum of 8 weeks.

Body strike in the flock can be prevented for a minimum of 14 weeks by jetting or spraying.

One pint of COOPER'S DIELTOX 20 makes fifty gallons of prepared insecticide sufficient for 400 sheep.

COOPER'S DIELTOX 20 IS YOUR EFFECTIVE ANSWER TO FLY

Obtainable from Merchants or Stores

COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD.
Box 599, AUCKLAND. Box 2274, CHRISTCHURCH

HIGHWAYS OF STEEL

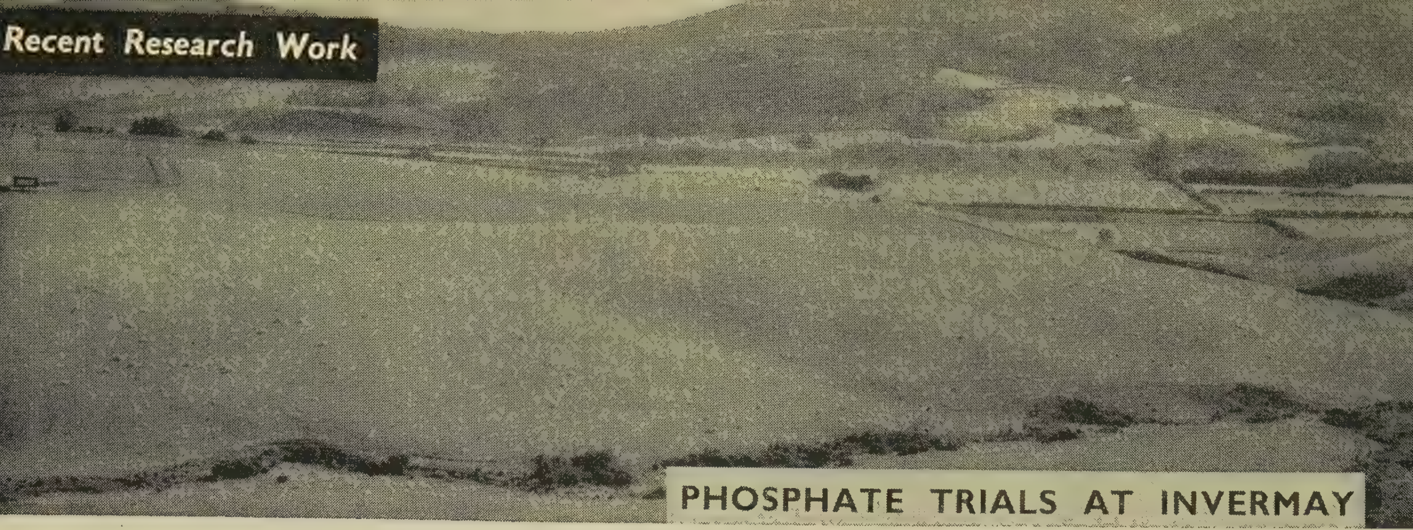
The Strength of our Nation

The very life of a progressive community depends upon efficient, economical transport . . . and no progressive community can possibly prosper without railways to carry the concentrated flows of heavy traffic into and out of the big towns and cities.

Here in New Zealand, 3,480 miles of railways—heavy-duty steel roads—provide the main arteries for our commerce . . . the basis for more productive use of power and human skill than is possible with any other means of transport.

USE TRAINS FOR TRANSPORT

NEW ZEALAND RAILWAYS



PHOSPHATE TRIALS AT INVERMAY

THESE notes summarise the results of 5 years' investigation on the second-class, molybdenum-deficient hill country at the Department of Agriculture's Invermay Research Station, Otago.

ONE trial was designed to measure pastures responses to different forms of phosphatic fertilisers and the other to determine the optimum rate and times at which phosphates can be applied and continue to give responses. The results obtained show that superphosphate is at least as good a phosphatic fertiliser as any of the other forms compared in these trials. Since in all trials pastures have responded extremely well to phosphate, the soil at Invermay has proved to be ideally suited for the study of different forms and rates of phosphate.

FORMS OF PHOSPHATE

Superphosphate and North African and finely ground Nauru rock phosphates were compared when applied at 3cwt. per acre. "Thermophos" (a calcium-magnesium fusion phosphate) and serpentine superphosphate were applied at a heavier rate so that the P_2O_5 (phosphate) content applied was equivalent to that contained in 3cwt. of superphosphate. These different phosphates were compared both in the presence and absence of lime.

Responses: In the absence of lime (pH 5.6) all except Nauru rock phosphate gave similar yields. When lime was applied superphosphate, serpentine superphosphate, and "Thermophos" yields were increased, whereas the North African and Nauru rock phosphate yields were depressed.

In the presence of molybdenum 1 ton of lime per acre per year failed to increase responses to superphosphate, serpentine superphosphate, and "Thermophos" beyond those obtained with annual dressings of 10cwt. of lime per acre. It is interesting to note that the annual dressings of 1 ton of lime per acre and 10cwt. per acre only maintained the soil reactions established at the outset of the trial—pH 6.9 and 6.5 respectively. In practice pH 6.0 to 6.2 should be satisfactory provided molybdenum is used. This level could be maintained by much lower rates of liming.

When the results of this trial are interpreted it should be borne in mind that the soil at Invermay has not shown any clear-cut sulphur responses. Thus on sulphur-deficient soils the results would not necessarily hold true unless some source of sulphur other than that present in superphosphate was applied.

No further annual applications of phosphates to this trial are being made; the residual effects of these forms of phosphates are now being studied.

HEADING PHOTOGRAPH: A general view of the second-class undulating hill country at Invermay, where studies on the forms and rates of phosphate requirements are being carried out.

RATES OF PHOSPHATE

A trial has compared different rates of phosphate when applied in March and September and twice yearly. The forms of phosphate chosen were superphosphate, lime-reverted superphosphate, and North African rock phosphate.

Time of application: The time of application proved to be important only during the first 2 years. It is understandable that no great differences would occur later, when the soil phosphate reached a higher level. Superphosphate and North African rock phosphate gave their highest yields after twice-yearly application, and lime-reverted superphosphate gave its highest yields after a March application. Subsequently the yields were not affected, but the time of response depended on the time of application; for example, autumn application gave highest spring yields.

Rate of application: In the first year 6cwt. per acre dressings of the phosphates gave appreciably higher production than 3cwt. per acre and in subsequent years slightly higher production. In other words a total of 24cwt. of phosphate per acre applied in 5 years yielded significantly more than a total of 12cwt. per acre.

The residual effects of these different rates of phosphate applications are now being investigated.

CONCLUSIONS

The conclusions to be drawn from these investigations on the second-class hill country at Invermay are:—

1. On this particular soil (not sulphur deficient) at a pH of 5.6 all forms of phosphate except Nauru rock phosphate (which was inferior) gave similar yields. Where lime was applied superphosphate, serpentine superphosphate, and "Thermophos" yields were increased, whereas the North African and Nauru rock phosphate yields were depressed.

2. In the presence of adequate molybdenum annual lime dressings of 10cwt. per acre were as good as 1 ton per acre. Other work suggests that even lighter annual dressings would be adequate.

3. Differences in production arising from different times of topdressing were not important except in the first 2 years. The time the response was obtained depended on the season of topdressing; for example, autumn application for early spring yields and September application for summer and autumn yields.

4. Annual topdressings of up to 6cwt. of superphosphate gave pasture responses. This evidence suggests that on this soil type much heavier phosphate dressings than are normal could be applied.

—*R. S. SCOTT*

Work in the Home Garden in October

By A. G. KENNELLY,
Horticultural Instructor, Department of Agriculture, Dunedin

SPRING is a busy season for most keen home gardeners and, because of the planting and sowing needed, October is usually one of the busiest months. Though killing frosts can be expected in some South Island districts until about the second week in November, in most northern districts and in favourable districts elsewhere first plantings of properly hardened, frost tender plants such as tomatoes, marrows, and cucumbers can be made. Seed of half-hardy and tender subjects such as dwarf and runner beans, sweet corn, cucumbers, pumpkins, and marrows can be sown toward the end of the month. In only a few districts can earlier plantings and sowings of these vegetables be made. Home gardeners who raise their own autumn and winter cabbage, curly kale, broccoli, and brussels sprouts can sow during October or, in most districts, not later than mid-November to have sturdy, well-grown plants for setting out in December or January.

DURING October successional sowings of salad vegetables should be made. Where the ground has warmed enough and frost danger is over seed of half-hardy plants such as dwarf and climbing beans, sweet corn, melons, pumpkins, squash, marrows, and cucumbers can be sown outdoors a few days before the last damaging frost usually occurs.

Such early sowings of half-hardy or tender plants should preferably be small, except in the most favoured districts of the North Island. where sowings may begin in late September or early October. Elsewhere ground temperatures are rarely consistently high enough for good growth, and loss of or damage to seed, for reasons associated with low temperature, is common.

Jerusalem artichokes can still be planted and in some southern districts it may not be too late early in the month to plant asparagus. Silver beet, lettuce, cabbage, broccoli, and even brussels sprouts can be set out if the seedlings are ready, and gaps in previously planted rows can be filled. Successional plantings of early potatoes can be made or second-early or main-crop varieties planted, though where well-sprouted tubers are planted shallowly early in the month, they, like those planted earlier, should be kept earthed up to prevent frost damage.

Preparation of ground for successional sowings should be continued and the soil can be made ready for the planting out of frost-tender subjects. Successional or main-crop sowings of peas, carrots, beetroot, lettuce, turnips, and parsnips can also be made.

Where the soil is not as rich as desirable, plants such as asparagus, spring cabbage, cauliflower, and silver beet will benefit from a weekly application of liquid manure. This can be made by soaking a quantity of animal manure in a large container of water or dissolving 1oz. of sulphate of ammonia in 2 to 3 gallons of water.

The culture of carrots, beetroot, lettuce, Jerusalem artichoke, onions, potatoes, silver beet, and green vegetables for autumn use was discussed in last month's "Journal". The September notes are applicable generally to October.

Broad Beans

Broad bean plants in most districts should now be approaching maturity. Tall varieties can be staked when they are about 3ft. 6in. high. Pinching out of the tops encourages plants to develop sturdy growth and often is sufficient to check an early attack of black aphids, particularly if there are plenty of the aphids' natural enemies, such as lacewing flies and ladybirds and their larvae, about.

In many gardens where tall varieties are grown it is advisable to support the plants as they develop or as they become heavy with pods. One or more strings run along the sides of the row and tied to stakes at intervals of 5ft. to 6ft. will save the plants from being blown over.

Pests and Diseases

Black aphid: This is also known to gardeners as black fly or plant lice and is a common pest of broad beans. Infestation is usually confined at first to the young, tender growth at the tops of plants. Spring-sown plants are affected worse than autumn-sown plants, as the growth on them is usually more tender than that on plants which have over-wintered.

If the plants are tall enough and aphid infestation is noticed when it is light, it can often be destroyed by pinching out the tender growth at the tops of the plants. Aphids can be controlled by lindane, HETP, or nicotine sulphate sprays. To be fully effective nicotine sulphate spray requires an alkaline substance, such as soap, dissolved in the water and to be applied on a hot, still day.

Chocolate spot: Broad beans have tender, easily damaged foliage which reacts by the development of reddish spots or stains to rubbing or similar superficial injury that may be caused by insect pests or diseases. Two parasitic fungi cause superficially similar chocolate-coloured spotting or "blight" on broad beans.

The commonest injury is caused by the fungous disease *Botrytis cinerea* Fr., which frequently attacks over-wintering broad beans. Where conditions favour it botrytis may be very destructive and cause extensive spotting, blotching, or defoliation. The chocolate-coloured markings on the leaves, leaf stalks, and stems of plants may be superficial or may penetrate some distance. They are commonly found on plants that have been subjected to severe winter weather.

Botrytis is a common cause of non-setting, as infected flowers usually rot and fall. Its spread is favoured by cool, moist weather. Lack of sufficient phosphate and potash in the soil makes plants more subject to the disease, particularly if the crop is dense and aeration poor and if the soil is poorly drained. A thiram, copper oxychloride, or bordeaux spray (4oz. of bluestone and 5oz. of hydrated lime to 4 gallons of water) is of value in combating the disease where it is likely to become serious.

However, spraying is rarely necessary, as the disease is largely influenced by the weather. As conditions improve the plants usually develop new, healthy growth and overcome most of the adverse effects of the disease.

The second type of spotting, commonly called bean blight, is due to the fungous disease *Ascochyta fabae*. It is characterised by the spots having greyish centres and minute pustular fruiting bodies in the central area. Control consists of the use of clean seed, good drainage, long rotations, and the destruction of rubbish.

Pests and diseases of broad beans are discussed on this page.

Frost may also cause reddish discoloration of the stem bases.

Rust: The fungous disease rust is characterised by small, dark brown, dusty raised spots (pustules) on the leaves, leaf stalks, and on the stems. On the leaves the spots are often characterised by a halo of slightly lighter green than the remainder of the leaf. The dusty appearance of the spots is due to the production of large numbers of spores of the fungus.

Infection results, according to its severity, in reduced cropping, stunting, or, rarely, the death of plants. The disease is difficult to control, but its severity can be reduced by applying at 2- or 3-weekly intervals a spray made of 4 fl. oz. of lime sulphur, 1 fl. oz. of colloidal sulphur, and 4 gallons of water. Sprays of a fairly new fungicide zineb, at intervals of 7 to 14 days, depending on the weather, have proved effective.

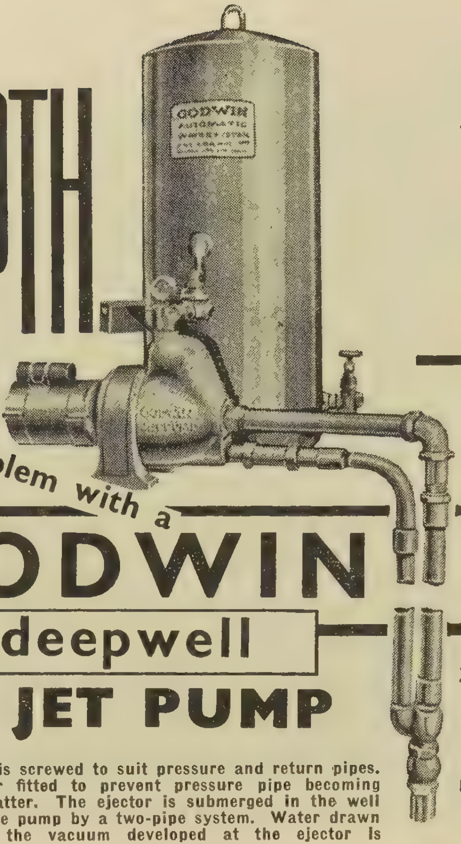
Sclerotinia disease: Sclerotinia is a fungous disease characterised by the development of a copious white fluffy growth and later of comparatively large black resting bodies (sclerotia), often inside the stems. The disease commonly attacks the main stems, usually near the bases, causing them to rot and plants to wilt and die. Seriously affected plants should be removed and burnt; if they are left, the resting bodies which develop constitute a source of infection for subsequent crops. Crop rotation, good drainage, aeration, and hygiene are the most important factors in control of the disease.

Wilt disease: Wilt may cause yellowing of the leaves and wilting and death of plants due to blockage of the conducting tissues of the lower stems and main roots. Moisture assists the development of the disease and later dry conditions hasten the death of plants. There is no practical control of the disease in the home garden, as it will live indefinitely in the soil. Rotation should be practised and peas, which are also subject to the disease, should not be sown in infected areas.

Celery

Though it is useful for soups and stews, celery is most popular as a salad vegetable. Most home gardeners like to set out plants as early as possible and though plants can be set out earlier where temperatures are high enough, December and January are the preferred months for planting. Later planting is only practical where autumns are mild.

For good growth celery should have a continuous and fairly high supply of moisture. In most districts regular spraying is necessary to keep the plants free from leaf diseases. However, temperatures are of first importance and if they are not high enough while the plants are young, self-blanching varieties will fail.



DEPTH

is no problem with a

GODWIN

deepwell

J3 JET PUMP

The deep well ejector is screwed to suit pressure and return pipes. Conical brass strainer fitted to prevent pressure pipe becoming blocked by foreign matter. The ejector is submerged in the well and is connected to the pump by a two-pipe system. Water drawn into the system by the vacuum developed at the ejector is raised to pump by the energy of circulating water.

ENGLAND'S FINEST PUMP

300 TO 620 GALLONS PER HOUR

The Godwin J3 Jet Pump is suitable for both shallow and deep well work, for pneumatic or open tank use. Model illustrated is a deep well electric system for use where there is a 25ft. to 70ft. lift to pump. Standard operating pressures for this system 20/40 P.S.I.

Units for open tanks also available with Briggs & Stratton petrol engines. Larger units than above also available.

For Fullest Details Contact:

Brown Bros.
ENGINEERS LTD.

Pumping Machinery Specialists since 1908

590 COLOMBO STREET
CHRISTCHURCH

P.O. Box 548P Telephone 65-195 (3 lines)

B.42

MALATHION

IS DEADLY TO INSECTS

It offers great control with greater safety

When you bring MALATHION into your insect control programme you'll soon discover its advantages over other insecticides. MALATHION gives a more efficient insect control, affords extra protection for your workers and avoids residue problems. MALATHION is fatal to a host of insects that infest fruit and vegetable crops, flowers, ornamentals and farm buildings. It is the only phosphate insecticide that makes safe handling easy. It is compatible with most other spray materials and its residues disappear quickly. MALATHION kills flies too—even those resistant to other insecticides.

British-made MALATHION is available in insecticide preparations from your local dealers.

MALATHION is the SAFER all-purpose insecticide.

CYANAMID OF GREAT BRITAIN LTD.
Farm and Home Division, Bush House, London, W.C.2.
Further information on MALATHION in Australasia may be obtained from:

Cyanamid Australia Pty. Ltd., at 59 Halstead Street, Hurstville, New South Wales, or C/o G. B. O'Malley, 377 Little Collins Street, Melbourne.

Home gardeners usually buy young celery plants, as the seedlings of self-blanching celery need to be raised in consistently higher temperatures than prevail in most districts without the aid of a glasshouse or heated frame. However, seed can be sown in October if suitable conditions can be maintained. Most varieties of self-blanching celery will begin to develop seed stalks if they are checked by a week or more of temperatures from 35 to 50 degrees F.

Celeriac

Celeriac or turnip-rooted celery is a good substitute for celery and takes less time and much less trouble to grow. It has a turnip-like root with a characteristic celery flavour. The roots mainly are used. They may be boiled, used in stews, or sliced and eaten raw as a substitute for celery in salads. Even the leaf stalk can be used when it has developed well.

Seed may be sown now, particularly as celeriac is not as well known as celery and few seedsmen sell plants, though most sell seed. Because it is very hardy, does not require to be blanched, and succeeds on a wide range of rich, moist, and well-drained soils, celeriac deserves to be more extensively grown by home gardeners who like the flavour of celery.

Seed is usually sown ⅛in. to ¼in. deep in rows 15in. apart when the ground has warmed in late September or October. Plants can be thinned to or set out 6in. to 8in. apart in rows 18in. apart, but they should not be set out deeply and should be liberally watered in dry weather. In very dry situations plants should be set out in shallow trenches to facilitate watering.

The soil should be rich so that plants make vigorous, continuous growth. During cultivation side shoots should be removed and the soil dragged away from the bulbous roots, which should be kept trimmed of all suckers, as they tend to cause unshapely development.

In districts which experience repeated severe frosts the roots can be lightly earthed up in autumn for protection, but lifting and storing are unnecessary except in heavy, poorly drained soil in exposed situations.

Varieties include Celeriac and Giant Smooth Prague.

Chinese Cabbage

Chinese cabbage is somewhat like cos or romaine lettuce, but the size of its oval, elongated head is usually nearer that of silver beet. It is sometimes called lettuce-cabbage, as the texture of its leaves is more like that of lettuce than that of an ordinary cabbage. Another name is celery-cabbage because of its flavour and because some of the forms resemble celery.

Chinese cabbage, which stores quite well after cutting, may be eaten either cooked or raw. The inside blanched leaves and heavy but tender midribs have a delicate celery-lettuce flavour.

Pea crops should be sown successionally if supplies are wanted over a long period.

The plant is tender and quick growing, the commoner varieties maturing in good conditions in about 70 to 90 days. It should be treated like lettuce, but as it grows much bigger, it needs wider spacing.

Chinese cabbage can be sown in spring, as it usually does well in the cool conditions then prevailing. Seed can be sown in good soil in a sheltered situation or in boxes under glass 3 to 4 weeks before plants are required for setting out. Spring or autumn sowing is best in most districts, because if plants are set out when the weather is hot and dry, growth is slow and consequently plants often fail to head properly, developing seed stalks instead.

Seed is best sown ½in. deep in rows 18in. apart in a moist, well-drained soil that is very rich in humus. When the seedlings are 3in. to 4in. high they should be thinned or transplanted 12in. apart in the rows.

Varieties include Wong Bok (Pao Ting), which is a short, quick-growing variety 9in. to 11in. high and up to 6in. in diameter. Pe Tsai is a taller and thinner variety than Wong Bok with looser leaves. It stands dry conditions slightly better, but its flavour is not usually considered as good as that of the others. Chihli is a tall, early variety 15in. to 20in. high with a base diameter of about 3½in.

Garlic

Garlic is very pungent and for those who like such flavours it is excellent for using in sauces, pickles, and for flavouring various dishes. The colder the conditions are under which it is grown the more biting or burning is its flavour.

Garlic is usually grown from cloves (the divisions of the bulbous root), which are set out when conditions are favourable from June to September. It can also be grown from seed, which is usually sown in September or October as soon as the ground has warmed enough for good growth.

The cloves are small bulbs which collectively make up most of the mature garlic bulb but which break away readily from the main stem or bulb. There are 10 to 12 cloves in an average bulb produced in groups of 1 to 5. In a mature garlic plant at the end of the season all the leaves of the current season's growth and the stem and roots die, leaving the cloves to continue for the next season.

The soil must be well drained or the bulbs may rot. Cultivation apart from

PLAYING SAFE

Round the Farm . . .

Is like money banked. And 'Tanalised' Timber fence posts, battens, stock yards, gates, stay trim year after year. They're SAFE from borer and rot. (Ask your merchant for the special 'Tanalised' Timber grade for ground use.) Don't take chances on farm upkeep—be sure with pressure - treated 'Tanalised' Timber.

'Tanalised' pressure treated Timber

Available from Timber Merchants.
Full details from:
HICKSON'S TIMBER IMPREGNATION CO. (N.Z.) LTD.
P.O. BOX 3762, AUCKLAND. TEL. 41-915.

FRANKLIN
BRAND-EM-OL
FRANKLIN
BRAND-EM-OL
BRANDING LIQUID

FARMERS! NO MORE FIRE - BRANDING
Brand Your Cattle with

BRAND - EM - OL

The proven Fluid Brand. Used by all Herd Improvement Associations in New Zealand.

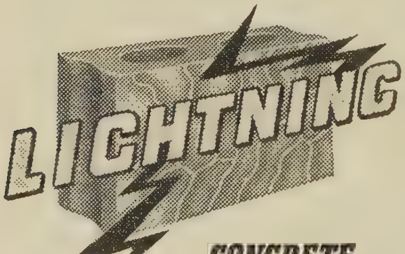
QUICK — PAINLESS — ECONOMICAL PERMANENT

OBTAINABLE AT ALL STOCK AND STATION AGENTS, HARDWARE STORES AND DAIRY COMPANIES, OR WRITE FOR PRICES AND FULL PARTICULARS TO —

EBOR SUPPLY CO. LTD.
P.O. BOX 594 - - HAMILTON

BUILDING ?

WHY NOT MAKE YOUR OWN CONCRETE BUILDING BLOCKS WITH YOUR OWN

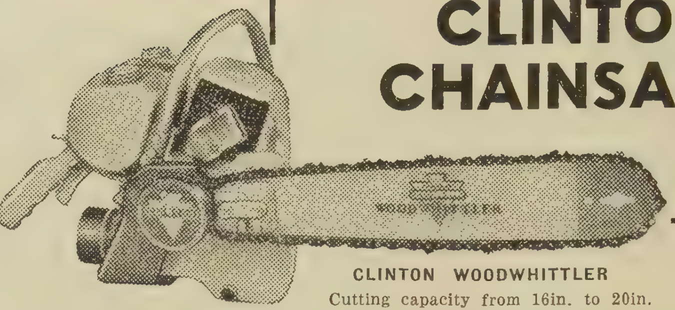


CONCRETE BLOCK MOULD ?

There are two sizes available, the 18in. x 8in. x 6in. for £18/10/0, or the 18in. x 8in. x 8in. for £19/12/6. With one mould you can make up to 100 Blocks per day for that Milking or Implement Shed, Pig House or Cottage.

ILLUSTRATED PAMPHLETS AVAILABLE FROM ALL STOCK AND STATION AGENTS OR HARDWARE MERCHANTS
or direct from H. E. NAPIER LIMITED,
Box 1555 :: Wellington
Also Available: Lightning Crazy Paving Moulds

CLINTON CHAINSAWS



CLINTON WOODWHITTLER
Cutting capacity from 16in. to 20in.

FARMERS ! SAWMILLERS !

Clinton have a complete range of Chainsaws to suit your every need. Prices range from as low as £73/7/6

CLINTON CHAINSAW DEALERS:

WHANGAREI, DARGAVILLE, KAIKOHE, KAITAIA, TE KUITI, KATIKATI, OPOTIKI, GISBORNE, PAEROA, TAURANGA, TE PUKE: N.Z. Loan and Mercantile Agency Co. Ltd.; AUCKLAND: Gane Milking Machine Co., Shroff & Sons Ltd.; HAMILTON: Gane Milking Machine Co. Ltd.; PAPAKURA: C. R. Chadwick Ltd.; ROTORUA: G. E. Gilltrap Ltd.; WHAKATANE: Cutler Bros. Ltd.; HASTINGS: Farm Mechanisation Ltd.; MANUNUI: Manunui Motor Co. Ltd.; NEW PLYMOUTH: Regent Motors Ltd.; STRATFORD: Sayers Bros.; WANGANUI: Wright, Stephenson & Co. Ltd.; PALMERSTON NORTH: Tractor Equipment Co. Ltd.; MASTERTON: N.Z. Farmers' Co-op. Dist. Co. Ltd.; NELSON: Levin & Co. Ltd.; Golden Bay Services Ltd.; BLENHEIM: Levin & Co. Ltd.; CHRISTCHURCH: T. G. Harty Ltd.; Hampton & Co.; THAMES, ASHBURTON, METHVEN, TIMARU: Dalgety & Co. Ltd.; DUNEDIN: Otago Machinery & Trading Co.; G. & J. Manson Ltd.; GORE: McLean's Machinery Ltd.; WESTPORT: Hampton & Co.

New Zealand Factory Representatives:
Messrs. AGRICULTURAL CULTIVATORS (N.Z.) LTD.
P.O. Box 1102, AUCKLAND.

Messrs. Agricultural Cultivators (N.Z.) Ltd.,
P.O. Box 1102, Auckland.

Please send me, without obligation, full details of the Clinton Chainsaw range.

NAME ....
ADDRESS ....
....

"walking in the rain" AND STAYING DRY IN DRYFOOT BOOTS

WATERPROOF
The DRYFOOT Boot

TAKE A LOT OF BEATING DRYFOOT BOOTS

★ Thoroughly waterproof ★ Super quality "Commando" Rubber Soles

THEY'RE HARD WEARING

DISTRIBUTED THROUGHOUT N.Z. BY SARGOOD SON & EWEN LTD

★ See your local store

weed control is unnecessary on most soils.

Bulbs of the common variety have membranous, silvery white skins, though there are pink and red varieties. Culture is generally similar to that of shallots or onions. Bulbs may mature in favourable conditions in about 16 weeks from planting of the cloves, though a longer time is usually needed to obtain plants from seed. Early planted seed usually requires about 20 to 24 weeks.

Mustard Greens

Alternative names for mustard greens are Chinese mustard and mustard spinach. Mustard greens are hardy, useful, and easily grown forms of greens that deserve to be more widely grown in home gardens. Though they are not commonly grown, they are not new. The improved strains now available and the modern appreciation of the value of fresh vegetables have made them better known.

There are several kinds of mustard greens — loose - leafed, broad - leafed, and curled types. The variety Tendergreen, which is also known as mustard spinach, is particularly fine. It has dark green, rather thick, fairly smooth, spoon-shaped leaves and combines the flavours of mustard and spinach. As it is slow to seed, its sowing in the hotter, drier districts need not be confined to spring and autumn, as is advisable with some of the other varieties.

A hearting variety (Hearting Chinese Mustard) is also sold by some seedsmen. The leaves grow 12in. to 14in. long and the hearts, which are about 6in. to 8in. across, blanch well. The flavour of most varieties is mild.

Though some varieties will grow fairly well in the poorer soils, for best results it is advisable to grow them in rich, moist soils and in moderately cool conditions. The open varieties particularly are an excellent substitute for spinach and should be gathered in the same way, though the leaves are larger than the largest spinach leaves. Thinnings should be pulled first and used with the roots cut off, and later when the remaining plants are large enough a few of the largest leaves can be taken off as they develop. They can be removed with the fingers or a pair of scissors and should be used when young and tender; they can be cooked like spinach or used in salads.

Seed should be sown ¼in. deep in rows 15in. apart. Seedlings of the open-leafed kind should be thinned to 6in. apart in the rows and of the hearting kind to at least 9in. apart under favourable conditions. The crop should be ready for use in from 35 to 45 days from seed sowing.

New Zealand Spinach

New Zealand spinach, which is a half-hardy, trailing annual with large, succulent leaves, can be sown in October. It is not a true spinach, but is valuable for use in hot, dry, sunny situations and is often preferred because it lacks the peculiar bitterness of true spinach. Growth is rapid in most soils, and it responds best to a light, fertile soil in a sunny position with adequate moisture.

Parsley should be sown twice a year in most gardens to ensure a continuous supply.

New Zealand spinach is harvested by pinching off about 3in. of the growing tips, which forces new shoots to develop, so that when established the plant has a multitude of tips for gathering. It grows quite large and should be given a spacing of at least 2ft. each way.

Seed, which is usually rather slow to germinate, should be sown 1in. to 1½in. deep not more than a week before frost danger is past. Two or three seeds should be sown together at each spacing and the weaker seedlings removed after establishment.

Parsley

Parsley is usually in constant demand and to ensure adequate supplies seed should be sown twice a year in most gardens, in spring and in autumn. The plant is a biennial and unless conditions are especially favourable, germination is usually slow; if two sowings are not made, there may be a break in supply. Parsley responds well to rich, well-drained soils, and fertiliser is just as necessary as for other crops.

Seed can be sown in rows or broadcast on a small prepared plot, but for best results the plants should be spaced about 8in. to 12in. apart when at the seedling stage. They make quite a good edging and do well in a cool, moist soil in the open or semi-shade. Seed may be slow to germinate, but sometimes germinates quite promptly if it is first soaked or is sown in very moist soil.

There are several types of parsley, but they are rarely listed by New Zealand seedsmen. They may be grouped as follows:—

(a) Plain-leafed or Italian: This is very hardy, but rarely grown in New Zealand.

(b) Fern-leafed: The leaves of this type are deeply cut, but the segments are not twisted.

(c) Curled: This is the most popular type of parsley grown in New Zealand and most seedsmen's catalogues list varieties of it. The leaves are deeply divided into segments which are twisted or curled over.

Within these groups there are dwarf, compact, and tall varieties. In addition the variety known as Hamburg, which is included with the coarser-leafed types, has an edible root about

ALWAYS SO HANDY TO
HAVE IN THE HOME !

3
IN
3-IN-ONE
OIL
LUBRICATES
CLEANS POLISHES
PREVENTS RUST-TARNISH

3-in-1 oil

lubricates, cleans, protects and fights rust. So handy for hinges, mowers, sewing machines and all the other oiling jobs.

B7-3

GET SOME TODAY !

at lambing time

VETSPEN
HYPODERMIC
"100"

when the need for penicillin treatment arises use

VETSPEN

Trade Mark

HYPODERMIC

PENICILLIN INJECTION

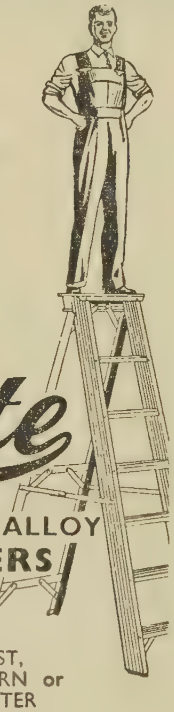
SAFE, EFFECTIVE, ECONOMICAL

VET-CREME *is a valuable antiseptic lubricant for use during assisted lambing. It reduces risk of cross infection and of damage to delicate tissues.*

VH8.7

GLAXO LABORATORIES (N.Z.) LTD. GLAXO PALMERSTON NORTH

LL12.7



PERFECT BALANCE

—Half the weight of wood

Lyte

ALUMINIUM ALLOY
LADDERS

CAN'T ROT, RUST,
WARP, BURN or
SPLINTER

Manufacturers.
LYTE LADDERS (N.Z.) LTD.
P.O. Box 790, 56 Victoria Street, Wellington

BULLETINS

A comprehensive display of Departmental bulletins may be seen at your local office: When in town, call and inspect them. You may see a bulletin that will solve that farming problem.

Golden sunshine . . . rolling white surf . . .

*Waikiki . . .
and YOU — there
on the sand !*

Who does not thrill to the magic of the Islands? Magic that lingers in the memory — like the sunny days and gay nights spent aboard the Mariposa or her sister ship the Monterey. Memories of life aboard a luxury ship—air-conditioned throughout — with accommodations all in first class. From Auckland to Fiji and on to Samoa, Hawaii, San Francisco, Los Angeles, and Tahiti on your return to Auckland.

UNITED STATES
HAWAII
SAMOA
TAHITI

The fares can be paid completely in N.Z. Currency. Regular sailings every 20 days. Information and reservations from any Matson Lines Agent or from the General Agents, Henderson & Macfarlane Ltd, 56 Quay St, Auckland

GO
Matson Lines

THE OCEANIC STEAMSHIP COMPANY
(Limited Liability—Inc. U.S.A.) 1.70

7in. to 8in. long and about 3in. thick, somewhat resembling a small parsnip in shape and colour. The roots are very tender when grown in a rich soil well supplied with moisture.

The different varieties of parsley vary in colour from light to dark green. Tall varieties have about 7in. to 8in. of stem and are suitable for bunching. The dwarf, compact varieties, which may be only about 5in. high, are useful in the home garden.

Drying Parsley

If two sowings are made each year, there should be no need to dry or store parsley, though storing is quite a simple matter. The most desirable dried parsley is obtained by constantly picking a few of the best young leaves as they develop in summer and autumn; dried spring parsley rarely keeps its colour.

The leaves can be laid out in single layers and dried in heated rooms, though most housewives will find it more convenient and the final product better if the leaves are dried at a temperature of about 90 degrees F. by putting them in a fairly hot oven with the door open. Quick drying is imperative if the essential oils that give parsley its characteristic scent are to be retained and too much of its colour is not to be lost.

When dry the parsley should be rubbed or pulverised and coarse pieces of stalk should be removed. The leaves can then be put in bags and should be stored in a dry place. If allowed to reabsorb moisture, they tend to become rubbery.

Parsley is sometimes gritty with soil from rain splashes, but it should not be cleaned with boiling water. If it cannot be cleaned with a thorough shaking, it should be washed under a cold tap.

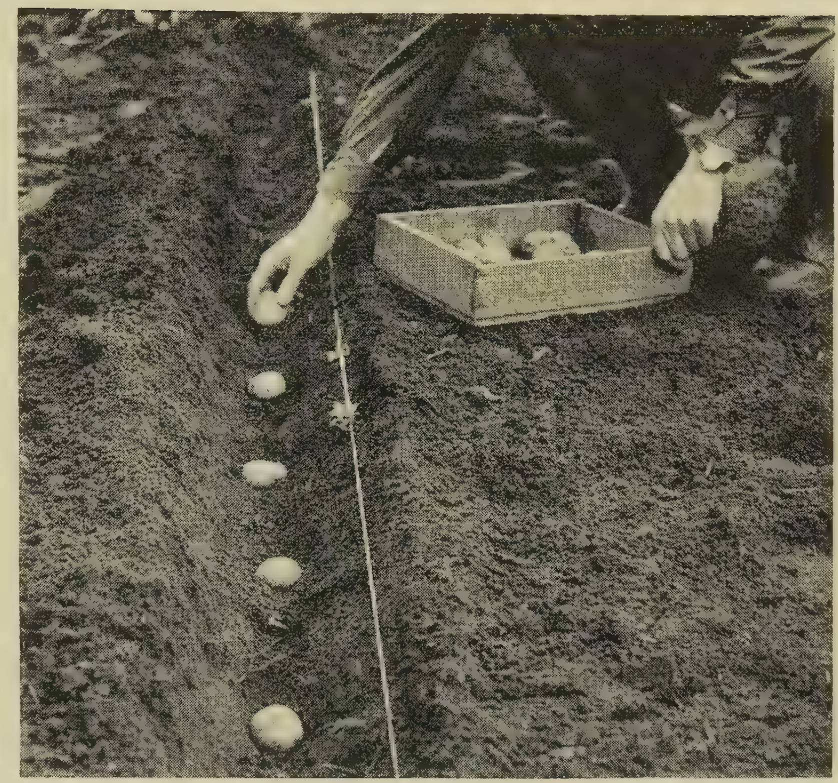
Because parsley is a biennial, it usually begins to send up seed stalks early in its second year. Little is to be gained, however, by picking them off, as the plant's energy becomes more and more concentrated on their production.

Greenfly is often troublesome on parsley, but is easily controlled by spraying with lindane or nicotine sulphate 1:800 (1½ teaspoons of nicotine sulphate to 1 gallon of water plus a little soap dissolved first in water).

Peas

Peas can still be sown in October where the soil is well drained and in good condition.

In good soils peas do not need heavy fertiliser dressings, and very moderate dressings of superphosphate alone have given good results with commercial crops on a wide range of soils. Garden peas are fairly tolerant of soil acidity and usually grow well in fairly acid soils, but moderate applications of lime, about 2oz. to 4oz. per square yard, are advisable on the more acid soils.



In most districts the main potato crop is planted in October. In well-drained soil a drill can be opened with a hoe, the fertiliser dusted along the drill, and the tubers dropped in and covered with soil.

Injury often results where fertiliser is applied in the drills with the seed. It is best applied to the soil 2in. to 3in. on either side of the seed row or at least 1in. under the seed. Fertiliser can be applied in a drill taken out with a hoe and partly filled in before the seed is sown.

Peas require well-drained, fertile soil and in any but the most fertile soils soil-improvement measures will be repaid. Deep digging of heavy soils and incorporation throughout the root area of moderate quantities of well-rotted organic matter are advised. Surface or near-surface applications are not only liable to cause seed injury, but may encourage surface rooting, which is to be avoided where conditions are likely to become dry.

A supply of nitrogen in the soil helps young plants to become established, but most soils that have been kept in good condition by regular dressings of well-rotted organic matter should be adequately supplied.

Seed for dwarf varieties should be sown 1in. to 2in. deep at about 10 to 15 seeds per running foot in rows at least 18in. apart. If the drills are taken out a little deeper and only part of the covering soil is put back, the hollow left will serve to mark the row and facilitate watering. Later the peas can be earthed up to some extent to keep the roots cooler and to hold the plants more firmly in windy conditions.

Early or second-early peas are most popular and include such varieties as Little Marvel, Utility, Early Crop, William Massey, Greenfeast, and Victory Freezer.

Pumpkins, Squash, Marrows, and Melons

The culture and soil requirements of pumpkins, squash, marrows, and melons are much similar, though melons need warmer conditions than the others. None of these plants should be sown in the open to be above ground before frost danger is past, and the ground must have warmed sufficiently and not be too wet or the seed is liable to rot. The plants thrive in a wide range of soils, from sandy to moderately heavy, provided there is an assured supply of moisture (preferably held in the soil) and plenty of organic matter.

Well-drained, light, warm, aerated soils are best for early crops, but for main crops heavier soils usually give a higher yield over a longer period. Organic matter can be increased by digging in a green crop, but particularly in colder districts better results are obtained if 1 cub. ft. of soil is removed at 2ft. to 3ft. intervals and the holes, except for the top 3in. or 4in., are filled with manure (preferably with partly rotted, fermenting stable manure).

Seed can be sown in soil placed on top or, preferably, at the edge of the manure. Rows should be at least 4ft. apart; this is known as the hill system of sowing. The ground should if possible be level after sowing to facilitate any necessary watering.

Apart from watering and weed control very little attention should be needed after plants are established. With trailing varieties it may be necessary to pinch out the ends of leaders when they are about 18in. long to encourage the development of laterals. Plants can be trained by pegging the runners with sticks.

The fruit of marrows should be cut when young, preferably before the skin hardens to the extent that it cannot be broken easily by the thumbnail; 10in. to 12in. is a good size. As marrows increase in size their flavour usually is reduced and the seeds increase in size. In favourable seasons, too, early cutting of the fruit induces more to develop. It is therefore inadvisable to allow fruit to reach full maturity unless very large specimens are wanted or fruit is to be stored for winter.

Butternut Squash

A small, pear-shaped bush variety of squash called Butternut is becoming more widely known. It has been grown in the U.S.A. for many years and is now produced commercially in some areas of New Zealand. The fruits, which are up to 1ft. long, have a sweet flavour and the necks are solid flesh. The small seed cavities are in the lower, bowl-shaped ends. The variety keeps quite well if stored under good conditions.

Rhubarb

Rhubarb responds to liberal manuring, but production from even the healthiest well-fed crowns is liable to be affected if heavy harvesting is continued too long. Pulling the stalks exhausts the plant, and the crown must be given an adequate period in which to develop the leaves which enable it to build up stores of plant food for the following season. Most varieties are dormant for a time and the leaves must be allowed to do their work before dormancy occurs. Beds should not become dry, and those of everbearing varieties that lack plant food should be watered with liquid manure.

Sweet Corn

Sweet corn is not a hardy vegetable. It thrives in warm, sunny conditions, and within limits the higher the temperature is and the more sunlight it receives the more likely it is to succeed. It can be grown in most districts in New Zealand, as it is less sensitive to cold than either the tomato or the snap bean, but it is not much grown in gardens in far southern districts.

Seed should be sown 1in. to 2in. deep. If planted in rows, plants should be 12in. apart and the rows 36in. apart; clumps should be 36in. apart and, though it is usually advisable to sow about 7 or 8 seeds at each clump to allow for failures, only 4 or 5 of the strongest plants should be left after they reach a height of about 2in. The number of seeds per ounce varies from about 100 to 230 according to variety.

Sweet corn matures in about 70 to 100 days and seed can be sown successionally.

Sweet corn is not specially sensitive to drought and usually bears earlier on light, sandy or peat soils.

Suckers often develop at the base of the plant during autumn and home gardeners sometimes remove them in an effort to increase the size and encourage early development of the cobs. However, usually the practice is more likely to result in loss than gain, as the removal of large suckers results in loss of plant tissue which is capable of elaborating plant nutrients into substances which go to the development of the cobs. It may also result in serious plant damage.

Correct Harvesting Stage

To be at its best sweet corn should be harvested at the correct stage of development. It retains its finest flavour and texture only for a short time, especially with early varieties. Corn cobs should be harvested in the milk stage while they are plump, juicy, and firm and the silk is fairly dry. The cob can be tested by pressing the thumb nail into one of the kernels. If a milky substance is forced out, the cob is suitable for harvesting; if the juice is watery, the cob is immature; if a doughy substance comes out, the corn is usually considered over-ripe.

Corn should be used as soon as convenient after harvesting, because its sugar changes to starch within about 36 hours. For those who want corn at its best that is a good reason for growing it in the home garden rather than buying it. If corn is not be used soon after harvesting, it is best cooled and held at as near freezing point as possible, as then loss of sugar is greatly retarded.

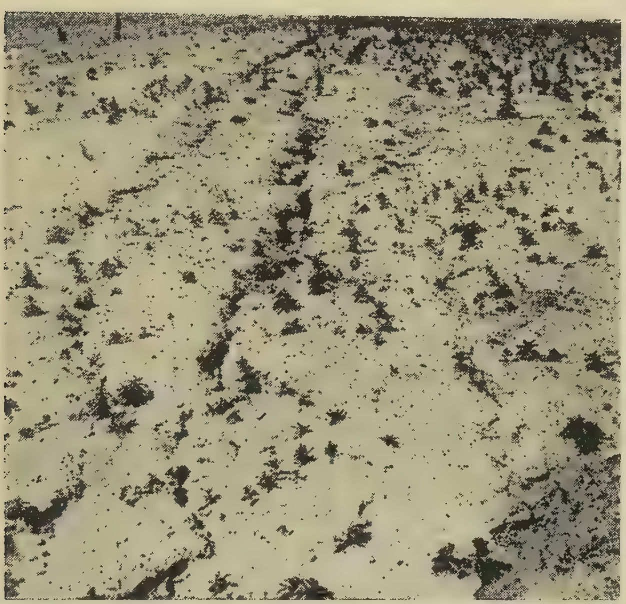
It used to be common practice for home gardeners to grow corn on "hills", but it is now generally agreed that there is little justification for the practice, as the raised soil surface about the corn tends to shed rain and makes watering difficult. Earthing up the stems of tall varieties is justified where winds are boisterous and the plants are not firmly established. It is a good plan, however, to grow corn in the sort of "hills" that are actually clumps, as corn is wind pollinated and pollen distribution is best where the plants stand in blocks.

All photographs by Green and Hahn.

Meteorological Records for July

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in inches					Bright sunshine hours
		Approx. mean	Difference from normal	Absolute maximum and minimum		Total fall	No. of days of rain	Difference from normal	Maximum fall		
				Maximum	Minimum				Amount	Date	
Kerikeri	201	49.7	— 0.8	64.6	28.4	3.10	20	— 4.29	0.99	16	175
Auckland	160	49.9	— 1.5	61.0	36.4	2.94	16	— 2.52	0.55	4	168
Tauranga	10	47.6	— 1.1	62.3	29.3	7.22	12	+ 2.18	2.91	17	183
Ruakura	131	44.8	— 1.7	61.2	23.7	4.20	14	— 0.53	0.92	4	148
Whakarewarewa ..	1006	43.9	— 0.4	57.7	26.9	5.51	13	+ 0.68	2.07	4	
Gisborne	12	48.0	+ 0.3	66.1	31.6	7.92	20	+ 3.51	1.37	4	105
New Plymouth ..	160	47.6	— 1.3	61.0	31.0	4.23	13	— 2.13	1.12	3	166
Karioi	2125	39.5	— 0.9	57.7	20.9	4.27	13	+ 0.08	0.71	3	
Napier	5	47.4	+ 0.1	62.7	32.5	5.32	11	+ 1.89	1.49	3	147
Wanganui	72	45.2	— 2.4	59.4	28.6	4.82	16	+ 1.90	1.62	3	133
Palmerston North ..	110	44.2	— 1.9	58.8	26.5	2.98	15	— 0.06	1.10	3	121
Waingawa	340	43.6	— 0.9	59.5	26.5	4.44	22	+ 0.50	1.64	3	94
Wellington	415	46.0	— 0.3	57.3	34.0	3.76	19	— 1.60	1.20	3	106
Nelson airfield ..	5	42.6	— 0.7	58.0	24.6	4.22	8	+ 0.99	1.79	16	162
Blenheim	12	44.0	— 0.1	60.5	24.8	2.04	8	— 0.57	0.63	17	174
Hokitika	15	43.0	— 0.6	57.0	27.1	3.64	11	— 4.86	1.12	15	158
Hanmer	1270	37.6	— 0.9	61.0	16.0	4.31	11	+ 0.11	1.61	18	109
Christchurch ..	22	43.0	+ 0.7	68.2	23.8	3.86	17	+ 1.26	0.92	17	129
Ashburton	323	41.6	+ 0.5	67.8	22.5	3.41	10	+ 0.79	0.80	4	139
Timaru	56	41.0	— 0.4	65.3	24.9	1.21	10	— 0.52	0.50	17	151
Alexandra	520	36.6	+ 0.3	61.2	18.5	0.45	11	— 0.21	0.11	15	98
Taieri	80	40.0	— 1.0	61.9	22.5	2.59	16	+ 0.65	0.42	4, 26	105
Invercargill airfield ..	0	40.6	+ 0.1	57.7	23.6	3.56	16	+ 0.75	0.63	26	118
Chatham Islands ..	140	45.5	— 0.1	55.4	32.0	3.81	25	+ 0.23	0.55	27	

Conservation Farming in Central Otago Restores Badly Eroded Cropland



By G. G. Calder,
District Soil Conservator, Department of Agriculture, Dunedin

▲ The condition of the land, showing rilling, the erosion of the land in rills or small gullies.

One of the large gullies being bulldozed in. Gully → erosion is the advanced stage of rill erosion, caused by a number of rills joining and forming a gully.

▼ Part of the area, showing one of the filled-in gullies.

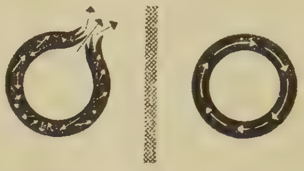
CONTROL of erosion on a practically abandoned area of 40 acres at Gibbston in Otago and its rehabilitation into first-class pasture within 5 years are described in this article. The paddock selected to demonstrate soil conservation methods of farming that will not only restore eroded land but will stop it getting into that condition had been cropped for many years with wheat and barley; most of the topsoil was washed away and the land was deeply rilled and gullied with only scattered weed growth present.

the
stripe means
something

. . . in polythene piping too! The *Red Stripe* on "CONTOUR PIPE" identifies it as the most technically advanced polythene pipe on the market. Only *Red Stripe* "CONTOUR PIPE" is *stress-free.* It has even strength —no weak areas.

Only *Red Stripe* "CONTOUR PIPE" is mirror-finished. It has a high-gloss exterior that firmly resists abrasion.

Both features are exclusive to "CONTOUR PIPE" and at no increase in price! When you want the finest polythene pipe, look for the pipe with the bright Red Stripe and brand name "CONTOUR" every foot.



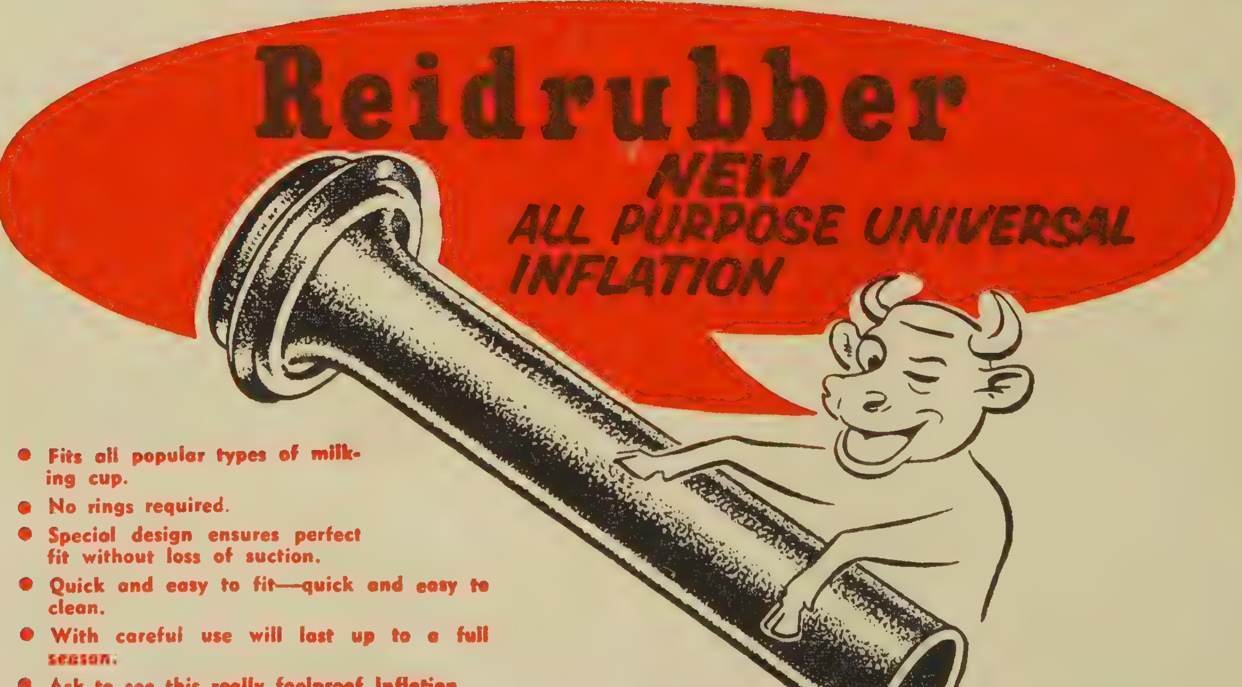
Before
UNEVEN
TENSION

Now
STRESS-
FREE

Red Stripe **CONTOUR PIPE**

REGD. TRADE MARK

Stress - free, stronger, same price



- Fits all popular types of milking cup.
- No rings required.
- Special design ensures perfect fit without loss of suction.
- Quick and easy to fit—quick and easy to clean.
- With careful use will last up to a full season.
- Ask to see this really foolproof Inflation.

Try it and you will find it's the best of its kind

[illegible]

LAND REHABILITATION IN OTAGO

AFTER the Soil Conservation and Rivers Control Council became established the Council appointed two District Soil Conservators to each of the North and South Islands. Part of their duties was to stimulate interest in the need for soil conservation methods of farming and to demonstrate these methods in the problem areas of their districts.

In the Gibbston, Shotover, Arrowtown, and Crown Terrace districts of Otago considerable erosion of farming land had occurred. This was brought about mainly by overcropping on a silt loam derived from loess, a soil type that is readily susceptible to sheet, rill, and gully erosion, particularly after the physical condition of the soil has been reduced or lost.

Mrs. M. E. Perriam, of Gibbston, kindly agreed to co-operate with the Soil Conservation and Rivers Control Council through the Otago Catchment Board by leasing a paddock for demonstration.

The lease of a 40-acre paddock was arranged from 1 January 1951 for 5 years, with the right of renewal for an extra 2 years if this were necessary to complete the work of rehabilitating the area, which was severely sheet, rill, and gully eroded and was almost depleted of vegetation except for about 7 acres of rocky outcrop and natural watercourse that had never been cropped and on which the soil was quite stable.

The paddock had been cropped for many years with wheat and then barley, until most of the topsoil was washed away and what was left had lost its physical condition. Rilling was prevalent and a number of the rills had developed into gullies up to 3ft. wide and nearly as deep. The area had been practically abandoned, as implements could no longer cross the gullies and only scattered weed growth was present.

The slope varied from about 5 degrees at the bottom of the paddock to about 10 degrees at the top. At two small mounds the slope was up to 20 degrees. With the loss of its physical condition the soil became caked and impervious to rain, run-off increased, and gullies developed, and the position was continually becoming worse. Rainfall is about 20in. per year or a little less.

Soil Conservation Methods

These conditions appeared to offer an excellent opportunity for the Soil Conservation staff to put their training into practice as well as to demonstrate the value and use of soil conservation methods of farming not only for rehabilitating worn-out land but to stop land getting into that condition. Conservation farming is intimately tied up with water conservation either in holding up all or part of the rainfall on the land or in disposing of surplus water in such a way that scouring and washing of the soil do not occur.

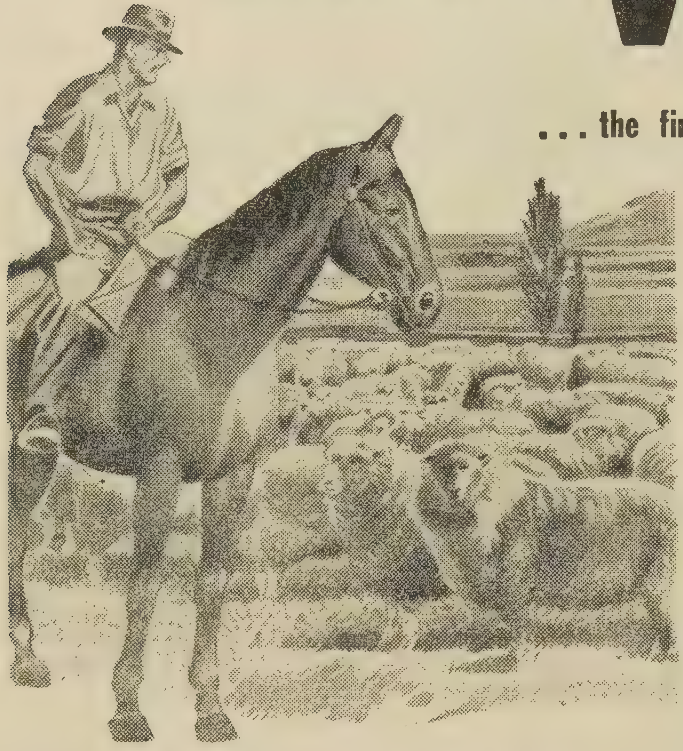
▲ The stubble has been disced and the graded banks have been constructed. Graded banks are narrow-based terraces not easily crossed by all types of farm machinery and are used on country too steep for broad-base terraces. Like broad-base terraces, graded banks have sufficient fall to take off surplus run-off.

← Part of the area, showing a graded bank on the left and a diversion ditch on the right. Diversion ditches are usually impassable to all farm machinery. They are used on steep slopes and have sufficient fall to divert all run-off water. They are usually located below areas where there may be considerable run-off to protect cultivated areas below the ditches from scouring or to ensure that contour cultivation is carried out between ditches.

▼ Water held up on the reserve after rain.

BRAND WITH Vacmark

. . . the finest Quality Sheep Branding Fluid in N.Z.



Vacmark is legible, long-lasting. Vacmark will not wash off the fleece even if rain comes after the brand has been applied. Takes perfectly to a wet fleece.

Vacmark scours out completely. Vacmark washes out easily in wool scouring works. There is no staining or damage to the wool.

Vacmark is easily applied. Vacmark can be used with a conventional branding iron or automatic branding pad.

Vacmark has four bright colours. Vacmark is sold in four colours — black, red, blue and green. The colour of Vacmark in the tin is not a true indication of the final colour of the brand. A few days after application, the brand brightens considerably.

Vacmark is economical. One gallon of Vacmark will brand about 600 sheep.

Vacmark is fully approved. All colours of Vacmark are approved by the New Zealand Department of Agriculture as wool marking preparations for the purposes of the Stock Act, 1908.

Available from all stock

and station agents.

CLEANER GRIP—

GREATER TRACTOR POWER

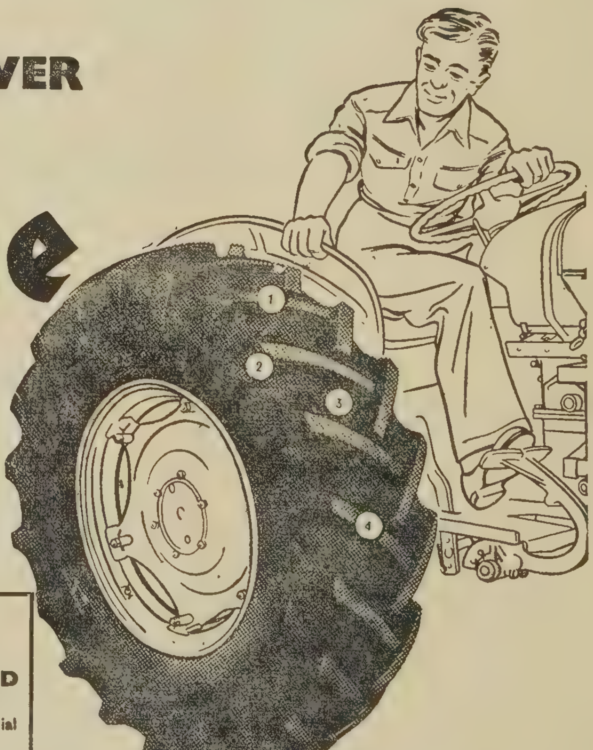
With

Firestone

OPEN-CENTRE

TRACTOR

TYRES



1.	2.	3.	4.
WIDE TREADS (greater Soil contact)	**TAPERED BARS** (Wedge-like gripping action)	**FLARED OPEN-INGS** (more positive cleaning)	**CURVED BARS** (greater initial bite)

Fit Firestone for outstanding Tractor performance

T1.6A

The problem on this area consisted of two parts:—

1. To stop water running off the land and make it soak in instead.

2. To bring back the physical condition of the soil so that pasture would hold on it.

For the first part mechanical means could be used to slow up the run-off of water, and for the second the ploughing in of green manure and use of a straw mulch would build up the humus content and improve the physical condition of the soil.

A bulldozer was hired to fill in the gullies so that a tractor and plough could cross them. The area was then ploughed on the contour. (To work land on the contour is to work it on the level instead of working up or down hill or on a slope.) This was not easy, as the contractor had difficulty in getting the plough into the dry, hard soil and then holding it in. Broad-base terraces to act as absorption banks were constructed on the contour on the gentler slopes at the bottom end of the field, and when the slope was too great for broad-base terraces graded banks were used on the contour. At the top of the field a diversion ditch was built with a fall of 1½in. to 2in. per chain to drain off surplus water from the hill at the back of the 40 acres. (Broad-base terraces are built on gentle slopes and are broad and low enough to allow all cultivating and harvesting machinery to cross them if necessary. They are constructed with sufficient fall to lead surplus run-off to a natural watercourse or grassed waterway. Absorption banks can be either broad-base terraces or graded banks built on the contour to hold up and absorb all run-off.)

A terracer was used to build the broad-base terraces and a giant disc fitted to one side of the tractor was used for the graded banks and diversion ditch. Later a Britstand grader-ditcher was used successfully for realigning the graded banks and for building two more diversion ditches. Trees were planted above the top diversion ditch to help stabilise and hold the land.

Crops

A mixture of ryecorn at 1 bushel and partridge peas at 2 bushels per acre was drilled in in April with 1cwt. of superphosphate per acre. All cultivation and drilling were done on the contour. By winter a good strike of ryecorn and peas was showing up. Some heavy rains had fallen and the contour drilling and harrowing of the crop, with the terraces and graded banks, had held up a considerable amount of water and soil. In some spots where the gullies had been filled the terraces had settled and sufficient soil had washed into them to block them and allow water to run over, thus causing some scouring.

By early summer the crop was much better than was expected and it was decided to harvest the best of it by direct heading instead of ploughing it in as green manure. This was done on 15 to 19 February 1952, when 183 sacks of mixed ryecorn and peas and 44 bags of peas were obtained.

The straw and remaining crop were then bush and bog disced and worked into the topsoil and because of ryecorn and peas which fell from the previous crop a good crop came away. Those terraces and banks that required attention were cleaned out and the banks were rebuilt. In October 1952 the green crop and straw from the previous crop were ploughed and harrowed on the contour, the ploughing this time being much easier than the first time.

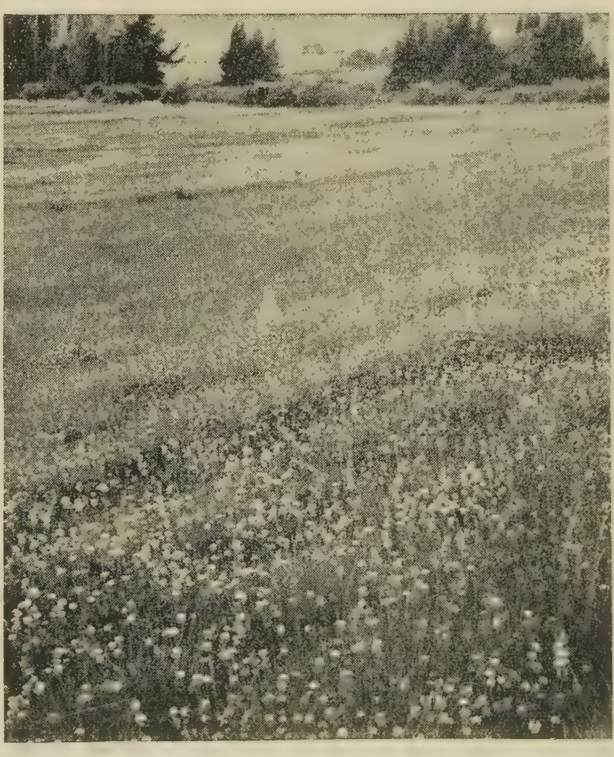
It was then realised that all absorption banks were not practical under the conditions at Gibbston. Consequently two more diversion ditches were constructed and given an outlet into the natural watercourse on the west side of the area. Also a number of the absorption banks were filled in and rebuilt as graded banks with a fall into the watercourse.

Seed Mixtures

The two new diversion ditches practically divided the paddock into three blocks each of about 11 acres. During

▲ The ryecorn and pea crop.

▼ The completed job shows good swards of ryegrass and white clover, graded banks, and, in the background, broad-base terraces.



20 to 23 January 1953 the three blocks were sown with the following mixtures per acre:—

Top block, 30lb. of Certified Mother perennial ryegrass, 4lb. of red clover seed, and 1cwt. of superphosphate.

Middle block, 30lb. of Certified Mother perennial ryegrass, 2½lb. of Certified white clover, and 1cwt. of superphosphate.

Bottom block, 10lb. of subterranean clover and 1cwt. of superphosphate.

Dry conditions after sowing delayed the strike, frost lift killed a considerable portion of the red clover, and the subterranean clover was very patchy; however, the white clover and ryegrass were satisfactory.

During April 147 points of rain fell in 6 hours, causing some washouts through over-topping of the terraces and graded banks with silt and water. The amount of growth gave very little protection to the soil surface. During May the terraces and diversion ditches were again cleaned out with the grader.

The ryegrass crop ripened over the Christmas period of 1953, when a header was unprocurable and most of the seed was lost. A stripper was borrowed and on 13 and 14 January 1954 12 bags of ryegrass seed were obtained. Thirty-seven bags of self-sown ryecorn were direct headed in February.

The area of subterranean clover had not developed very evenly and was worked up to scatter what subterranean clover seed was present; also 16 bushels of perennial ryegrass and 15lb. of white clover were sown.

A visit during May 1954 showed a tunnel gully (underground) forming at one of the points where run-off had ponded in a depression of a graded bank. The gully was filled and the graded bank realigned and given a fall to carry water away from this point.

By the summer the subterranean clover had thickened up well and the white clover and ryegrass were good, though the red clover was still poor.

In February 1955 a sack of subterranean clover was harvested experimentally and a further 13 sacks of volunteer ryecorn were also headed. The white clover was good and allowed to seed and the sack of subterranean clover was sown on the red clover block.

During winter and early spring the whole 40 acres were heavily grazed by sheep, and grazing will now be continued.

Successful Rehabilitation

A field day was held in October 1955, when local farmers and those from surrounding districts were present and inspected the area. It was agreed that not only had erosion been controlled and the paddock rehabilitated into first-class pasture, but that with the system of controlling run-off there should be no risk of the paddock deteriorating again.

The main lesson learnt from the area was the need to provide a fall not only for diversion ditches but also for graded banks and broad-base terraces. Also due attention must be given to surveying the lines, particularly when gullies are being crossed, so that there is no ponding of water. The gullies were the weak spots, particularly where filling had been done. Absorption banks do not appear practicable on their own where the rainfall approaches 20in.

The 5-year lease ended in December 1955. It was not necessary to exercise the renewal clause in the lease, as restoration of the land to safe, permanent production had been achieved.

Cost of Work

The following statement shows receipts and payments for the 5-year period:—

Receipts

	£	s.	d.
Sale of ryecorn, peas, and ryegrass seed	429	17	4
Estimated value of grazing	25	0	0
	454	17	4

Payments

	£	s.	d.
Cultivation at contract rates ..	293	2	7
Seed	172	3	2
Superphosphate	66	17	9
Labour	105	11	6
Harvesting at contract rates ..	251	8	3
Tree planting	14	11	6
Fencing materials	12	6	6
Freight charges	10	9	11
	926	11	2

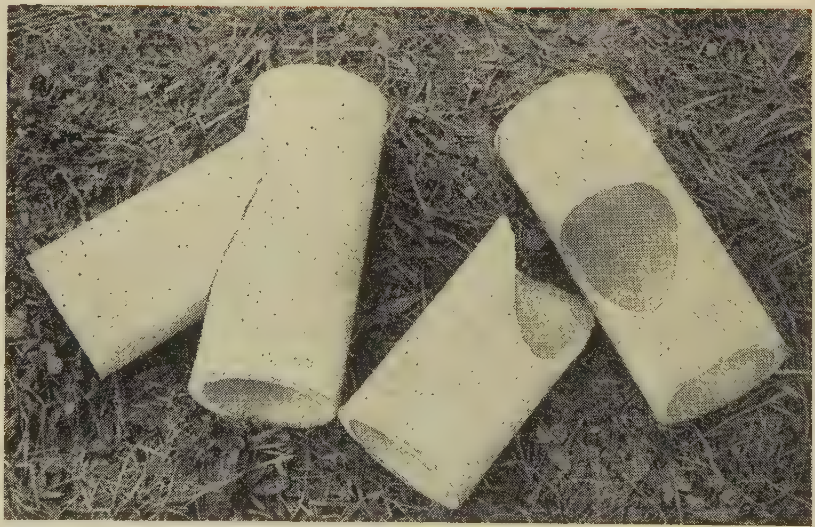
The net cost of development on the area was £471 13s. 10d. or £11 15s. 10d. per acre over the 5-year period. However, the cost could have been substantially reduced if the work had been done by the farmer herself and if machinery had been available to harvest the 1953-54 ryegrass seed crop.

Main Objects Achieved

The main objects of the project, however, were achieved. These were: To demonstrate soil conservation methods of farming that will not only rehabilitate eroded farm land but will stop land getting into that condition; and the carrying out of the soil conservation farming concept of "using each acre according to its capability and treating it according to its needs so that it may produce forever".

Applications for advice or assistance on these lines should be made to a local Catchment Board or Soil Conservation District Committee. Where neither of these bodies has been set up applications should be made to the local Soil Conservation Service of the Department of Agriculture.

New Type of Tile Junction



[Niederer

A new type of tile junction developed by a Waikato manufacturer to reduce cost of production. There seems no reason why this sort of junction should be any less efficient than the conventional Y type, but the cost of this new type in the Waikato is considerably less.

Probable Effects of Manuka Blight on Beekeeping in North Auckland

By D. ROBERTS,
Apiary Instructor, Department of Agriculture, Auckland

SINCE first noted in the Canterbury district in 1937 the scale insect *Eriococcus scoparium* has by natural spread and artificial distribution become widely established throughout the country. The insect is found associated with both red manuka (*Leptospermum scoparium*) and white manuka or kanuka (*Leptospermum ericoides*). After infestation by the insect, plants of both species develop a heavy coating of black fungus. The condition of infestation by both insect and fungus, commonly called manuka blight, though not destroying kanuka has proved lethal to manuka, and its use for biological control of this species has become extremely widespread in North Auckland. This article discusses the importance of manuka and other nectar sources to North Auckland beekeepers and adjustments in apiary management that may be necessary when the main source of nectar disappears as a result of manuka blight.

MANUKA blight, though only of comparatively recent introduction to North Auckland, has spread rapidly in most districts and today gives the impression that it will eliminate the manuka within a few years. In the northern part of Hokianga County a great proportion of the manuka has been destroyed already and in most other counties large areas are either dead or dying. Because the black fungus which appears on infected manuka plants is often found on other species growing in association with manuka, there have been many reports of the blight affecting other plants.

There is to date no direct evidence that the presence of this fungus on other species is due to other than distribution by wind and rain. The coccid insect responsible for the blight is a highly specialised feeder and it seems unlikely that any adaptation to other plants, as a source of sustenance, will occur.

Increased Land Development

Apart from the destruction of manuka by blight, the tremendous increase of land development, both by the State and private enterprise, which has taken place in the post-war years has contributed also to the rapid diminution of manuka. This factor in itself must be of increasing consequence to beekeepers, as it is the more readily accessible and workable areas that are being so rapidly developed. Had the blight not been introduced, it is likely that sufficient

HEADING PHOTOGRAPH: Association changing from dominant manuka to dominant bracken fern as a result of manuka blight infestation.

The Bank known for service to the farmer

New Zealanders today can be justly proud of the B.N.Z., New Zealand's own bank. With nearly 380 Branches and Agencies throughout the Dominion it is New Zealand's largest trading bank. As the bank itself is widespread, so are its services, and its on-the-spot knowledge of local farming problems has earned it the title of the 'Bank that serves New Zealand best'.

BANK OF NEW ZEALAND

BANK WITH THE BNZ

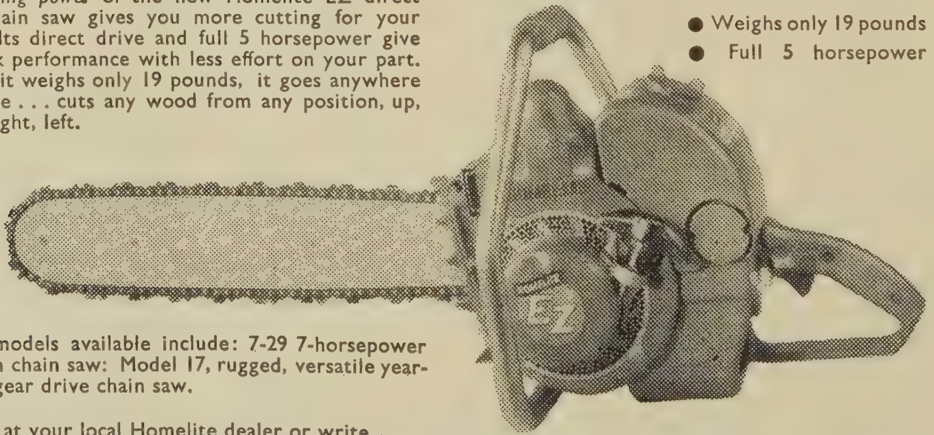
F1.7

NEW

HOMELITE
DIRECT DRIVE
EZ CHAIN SAW
WITH
FLOATING POWER

Here's new help for every farmer . . .
the *floating power* of the new Homelite EZ direct drive chain saw gives you more cutting for your money. Its direct drive and full 5 horsepower give you peak performance with less effort on your part. Because it weighs only 19 pounds, it goes anywhere with ease . . . cuts any wood from any position, up, down, right, left.

- Weighs only 19 pounds
- Full 5 horsepower



Other models available include: 7-29 7-horsepower one man chain saw: Model 17, rugged, versatile year-round, gear drive chain saw.

Enquire at your local Homelite dealer or write

CABLE-PRICE CORPORATION LTD.

Auckland, Wellington, Christchurch, Dunedin, Hamilton, Rotorua, Napier. 1·7a

manuka to meet the needs of established apiarists would have remained in the less accessible and broken areas for many years. It is in these areas, however, that the blight has been introduced and has spread unchecked.

Biological control of manuka by blight undoubtedly offers great advantages where immediate development of the land into pasture is undertaken on the death of the manuka, but where this is not done or is impracticable because of the contour of the land, infestation by more undesirable plants and weeds is occurring.

Unfortunately it seems that these secondary infestations will be of plants unlikely to be of economic importance to beekeeping and the existence of a healthy, vigorous beekeeping industry is important to the economic welfare of agriculturists and pastoralists. Intensive land development and the widespread use of modern insecticides have so depleted the numbers of wild pollinating insects that the honey bee is today the only insect of consequence in providing the pollination so essential to the reproduction of clovers and related pasture plants.

Manuka as Source of Nectar

A vigorous beekeeping industry cannot exist in any area unless that area supports plants yielding nectar sufficient to return to the beekeepers an adequate living from the sale of honey. In the past the honey crops of North Auckland have generally been gathered from manuka and some have been secured wholly from this source. Hive management and the choice of apiary sites, with few exceptions, have developed around the manuka honey flow. Because of the quality of thixotropicity inherent in manuka honey much time and thought have been devoted to the improvement and utilisation of honey house equipment designed to handle this particular type of honey and over the years a very high degree of efficiency has been attained which has enabled the production of a honey of a very high standard.

Though it may be thought that with the elimination of manuka and the progress of extensive land development sufficient nectar from pasture plants will become available to beekeepers to provide a payable alternative, the presence of nectar-yielding plants does not automatically guarantee a honey crop.

In assessing the possibilities of honey production from the clovers, which are the mainstay of beekeepers in many parts of New Zealand, it must be borne in mind that these plants produce nectar attractive to bees only when soil conditions, temperature, and relative humidity are favourable.

North Auckland is predominantly a dairying area and its development is based on the establishment of permanent pastures and though in the laying down of pastures clover-ryegrass seed mixtures are commonly sown, a proportion of paspalum is included in most seedings. Though the clovers may be dominant for the first 2 or 3 years after sowing, paspalum establishment is very rapid, with the result that most North Auckland pastures contain a very strong growth of this grass from early summer onward. This vigorous growth of paspalum overgrows the clover at the period when it is most likely to yield nectar.

The high average relative humidity generally experienced throughout the area is another factor militating against good clover honey production. High relative humidity, though not perhaps affecting the **amount** of nectar secreted by clover, does seriously influence its sugar concentration. The sugar concentration of the nectar under conditions of high relative humidity is often so low that the nectar loses all appeal to honey bees.

Most exotic nectar-yielding trees and plants common to the area are similarly affected. Indigenous trees and plants are also affected, but to a much less degree. Pohutukawa is one common indigenous plant that is even more affected than most exotics, the nectar, which is generally secreted prolifically, being attractive to bees only in warm, dry, windless conditions.

It is apparent that under prevalent farming practice and weather peculiar to the area the clovers alone cannot be relied on to provide a reasonably economic return to beekeepers in North Auckland.

The trefoils, buttercups, and various other less common plants yield nectar well in most seasons, but under present management systems the crops from these are as a rule only supplementary.

Other Sources of Nectar

From its inception up to the present beekeeping in North Auckland has been based mainly on the nectar yielded by trees and shrubs. With the felling of the forests and the initiation of large-scale land development the incidence of many indigenous nectar-producing trees and shrubs has been reduced so greatly that today only manuka and kanuka are sufficiently widespread to be of interest to all beekeepers.

Though it is not generally accepted by beekeepers that kanuka yields nectar consistently, it is known to be worked by bees for nectar occasionally. When growing in association with manuka it does not seem to offer an attraction sufficient to overcome the counter-attraction of the rich manuka nectar, but in the absence of this competition it may possibly provide a substantial source.

Young blighted manuka.

Rewarewa, cabbage tree, bush lawyer, and various other nectar-producing trees and shrubs are present in bush and scrublands, but with the exception of the few remaining forest areas they are nowhere in sufficient quantity to be of more than secondary importance.

Two exotic shrubs, a legume *Psoralea pinnata*, locally called blue pine, and a member of the *Erica* family known as pink heath (*Erica baccans*) have become established in certain limited areas.

Blue pine, found mainly in isolated stands, yields nectar prolifically and is the source of a fine, white, mild-flavoured honey. Pink heath is confined to one area on the coastal lands west of Dargaville. It, too, yields nectar prolifically and crops of a dark, rather aromatic-flavoured honey can be secured from apiaries located within the larger stands of this shrub. Neither of these shrubs is present in sufficient quantity, however, to be of widespread importance and they are of value only to beekeepers situated within the limited areas of their establishment.

Pohutukawa (*Metrosideros tomentosa*) is common in coastal areas, but it is generally much more prevalent on the eastern side of the peninsula. Pohutukawa yields nectar very heavily indeed, but because of its particular susceptibility to the effects of high relative humidity, temperature changes, and wind, it is not a reliable source of honey. The sugar concentration of the nectar is so readily depressed by these factors that the securing of good crops from this source is the exception rather than the rule.

Hive Management

The systems of hive management in North Auckland have largely developed around the manuka honey flow. Large crops from this source have been secured under the present type of management, but it seems likely much of the later pasture honeys are lost. Bees brought to strength at a time which will enable them to gather a good crop of manuka honey seldom seem able to take the best advantage of subsequent flows unless the hives are moved some distance to a new site, as occurs in migratory beekeeping practised in other parts of the world.

The manuka honey flow, in varying degrees of intensity, often lasts for some months. Colonies that have built up strength and gathered a crop on it seem to lose the urge to work intensively and fail to exploit subsequent sources to any great degree. There is no definite reason for this behaviour, but it seems that a combination of the length of the manuka flow, the very high sugar content of the manuka nectar, and its ready accessibility is responsible. Bees working manuka often will be found to neglect and fly over other sources yielding nectar of quite high sugar concentration.

It has been found that colonies in manuka areas which are slow in building up and fail to reach gathering strength in time for the manuka flow often secure much better crops of the later pasture honeys than those that reach full strength and gather a surplus on manuka.

It is evident that the best results from any one nectar source can be secured only by hive management directed to that particular source with colony development controlled to that end. With the almost total disappearance of manuka in North Auckland, a likely possibility in the near future, and the uncertainty of securing payable yields from other tree sources, it is apparent that if beekeeping is to remain an economic proposition in the area, a widespread adaptation to changing circumstances will be needed.

Beekeepers who have apiaries situated within economic distance of the few remaining larger areas of native forest will no doubt continue to secure payable crops with present practices. To ensure that they continue successfully in commercial beekeeping others less fortunately situated and where manuka is fast disappearing should make a close study of alternative nectar sources with a view, if necessary, to the readjustment of apiary sites and to the developing of appropriate management techniques.

* * *

Radio Broadcasts for Farmers

RADIO broadcasts for farmers during October are as follows:—

1YA Auckland, 7.45 p.m.

2 October—"Silage", by G. L. Banfield, Instructor in Agriculture, Department of Agriculture, Thames.

9 October—Talk by officer of Animal Industry Division, Department of Agriculture, Auckland.

16 October—"Control of Tall Fescue and Kikuyu Grass", by C. M. Blick, Fields Instructor, Department of Agriculture, Warkworth.

23 October—Talk by officer of Animal Industry Division, Department of Agriculture, Auckland.

30 October—"Rush, Gorse, and Blackberry Control", by D. A. Newman, Instructor in Agriculture, Department of Agriculture, Dargaville.

1XH Hamilton, 12.33 p.m.

14 October—"Metabolic Diseases in Cattle", by O. V. Griffiths, Veterinarian, Department of Agriculture, Hamilton.

21 October—"Sheep Farming as a Business", by R. H. Wynyard, Federated Farmers, Hamilton.

1YZ Rotorua, 7.15 p.m.

2 October—"Cream and Milk Grading Standards", by R. J. Preston, Butter Instructor, Department of Agriculture, Hamilton.

16 October—"Young Farmers' Clubs", by Eastern Bay of Plenty district committee.

30 October—"Crops for Winter", by S. D. Clay, Instructor in Agriculture, Department of Agriculture, Matamata.

2XA Wanganui, 8 p.m.

3 October—"For the Country Woman", by Mary MacDonald.

10 October—"The Radio Vet.", by S. Jamieson, Veterinarian, Department of Agriculture, Wanganui.

17 October—"Dipping Sheep", by J. F. Munting, Livestock Instructor, Department of Agriculture, Wanganui.

24 October—"From Farm to Factory—A Shearing Review", by J. Ball, Sheep and Wool Instructor, Department of Agriculture, Wanganui.

31 October—"The Efficient Use of Fertilisers", by A. K. Booth, Instructor in Agriculture, Department of Agriculture, Wanganui.

2ZA Palmerston North, 12.33 p.m.

7 October—"Fertility in Cattle" by G. T. Williamson, Veterinarian, Department of Agriculture, Palmerston North.

14 October—"Insect Control in Crops", by J. A. Graham, Fields Instructor, Department of Agriculture, Palmerston North.

21 October—"Producing Vegetables for Market", by G. N. Paulin, Horticultural Instructor, Department of Agriculture, Palmerston North.

2YZ Napier, 7.10 p.m.

8 October—"Milking Hygiene", by L. W. Scott, Farm Dairy Instructor, Department of Agriculture, Hastings.

22 October—"Common Diseases of Livestock", by J. J. Byrne, Veterinarian, Department of Agriculture, Hastings.

3YA Christchurch, 12.20 p.m.

7 October—Talk by officer of Extension Division, Department of Agriculture, Christchurch.

21 October—Review of "The New Zealand Journal of Agriculture" (October issue), by E. G. Smith, Instructor in Agriculture, Department of Agriculture, Rangiora

4YA Dunedin and 4YZ Invercargill, 12.33 p.m.

7 October—"Preparations for Irrigation", by R. C. Schofield, Instructor in Agriculture, Department of Agriculture, Alexandra.

14 October—"Thinning of Fruit", by W. S. Kemp, Horticultural Instructor, Department of Agriculture, Alexandra.

21 October—"Insect Pests", by A. R. Rankin, Fields Instructor, Department of Agriculture, Invercargill.

4YZ Invercargill (following joint programme from 4YA and 4YZ)

7 October—"Rearing of Calves", by C. E. Isaacs, Veterinarian, Department of Agriculture, Invercargill.

14 October—"Seed-bed Preparation", by T. L. Reid, Fields Instructor, Department of Agriculture, Gore.

21 October—"Wool Improvement", by W. F. Dick, Sheep and Wool Instructor, Department of Agriculture, Invercargill.

Regular Sessions

1XH Hamilton, Mondays at 12.33 p.m. and Tuesdays at 8 p.m. (Frankton stock market report), Wednesdays at 12.33 p.m. (report from Ruakura Animal Research Station), Thursdays at 12.33 p.m., Fridays at 8 p.m. (stock sale review).

1XN Whangarei, Mondays at 8 p.m. (Northland livestock report and "Farming for Profit"), Wednesdays at 8 p.m. ("Farming for Profit"), and Fridays at 8 p.m. ("News for the Farmer").

1YA Auckland, Mondays at 12.33 p.m., Tuesdays, Wednesdays, and Thursdays at 7.45 p.m., and Fridays at 6 p.m. and 7.45 p.m.

1YZ Rotorua, Mondays at 12.33 p.m. (Waikato stock market review), Tuesdays at 7 p.m. (Hamilton stock market report), Wednesdays at 7.15 p.m. (Pig Council talk on fourth Wednesday of every other month), Thursdays at 12.33 p.m. and 7.15 p.m. (fortnightly).

2XA Wanganui, Wednesdays at 8 p.m. (Wanganui stock sale report), Thursdays at 8 p.m.

2XG Gisborne, Tuesdays at 8 p.m., Fridays at 8.2 p.m. (Gisborne stock market report).

2XN Nelson, Thursdays at 8 p.m.

2XP New Plymouth, Thursdays at 8.1 p.m.

2YA Wellington, Mondays at 7.15 p.m., Thursdays at 12.33 p.m., Fridays at 7 p.m. (Feilding stock market report).

2YZ Napier, Tuesdays at 12.12 p.m. (Hawke's Bay orchardist session), Tuesdays at 7.10 p.m., Wednesdays at 7.15 p.m. (Hawke's Bay-Poverty Bay livestock market report), Thursdays at 12.33 p.m.

2ZA Palmerston North, Mondays at 12.33 p.m., Fridays at 8.45 p.m. (Feilding stock market report).

3XC Timaru, Mondays at 8 p.m. (Pleasant Point stock market report), Tuesdays (fortnightly) at 8 p.m. (Temuka stock market report), Wednesdays at 8 p.m., and Saturdays at 10.30 a.m.

3YA Christchurch, Mondays at 12.20 p.m., Wednesdays at 7.15 p.m. (Addington stock market report), Thursdays at 12.33 p.m. and 7.15 p.m.

3YZ Greymouth, Mondays and Thursdays at 12.33 p.m.

4YA Dunedin, Mondays at 12.33 p.m., Tuesdays at 12.33 p.m., Wednesdays at 12.33 p.m. and 6.50 p.m. (Burnside stock market report), and Thursdays at 12.33 p.m.

4YZ Invercargill, Mondays at 12.33 p.m., Tuesdays at 12.33 p.m. and 7.15 p.m. (Lorneville and Gore stock market reports), Wednesdays at 12.33 p.m., and Thursdays at 12.33 p.m.

* * *

Overdrilling Pumice Pastures

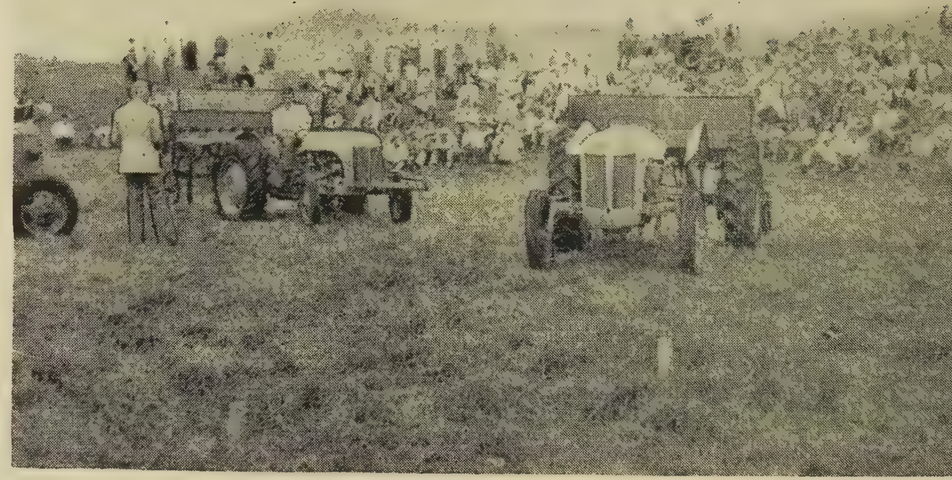
By G. S. ROBINSON, Senior Lecturer in Field Husbandry, and M. W. CROSS, Senior Lecturer in Farm Machinery, Massey Agricultural College

SOME of the disadvantages of having pastures with a high proportion of clovers were commented on in the April 1956 issue of the "Journal of Agriculture" by C. R. Taylor. In particular, this report pointed out that swards lacking ryegrass give poor yields of autumn-saved pasture and do not therefore provide their share of winter grazing. These pastures also lead to digestive disorders, the most serious of which is bloat.

FOR those readers not aware of the particular problems of newly sown pumice pastures some explanation may be necessary. Each year since the war thousands of acres of pumice scrub land have been burnt, cultivated, and sown with pasture mixtures. The natural fertility of the soil is very low and consequently grasses are not prominent in the young pastures. On the other hand, clovers make remarkable progress, and if amply supplied with phosphate, dominate the pastures for the first 5 or 6 years at least. The grasses which do survive are weakened further by the smothering effect of the strongly growing clovers.

As a result of the vigorous clover growth over a number of years the nitrogen status in the soil is built up to a stage where the grasses would respond to it if they were present. Too often, however, they are very poorly represented and so cannot assume their rightful place in a high-yielding pasture.

With these problems in view, and following a direct request from farmers in the Whakamaru district, the authors conducted a field day there on overdrilling grasses into the sward in the autumn of 1956. The demonstration was held on the dairy farm property of Mr. D. Tong, whose active co-operation is gratefully acknowledged. This article gives an account of the treatments used, the results obtained, and the conclusions derived from the sowings as judged from an inspection of the area 6 months later



Some of the machines and spectators at the demonstration.

Preliminary Considerations

It has been determined from numerous trials conducted by one of the authors that the successful establishment of seedlings following overdrilling or oversowing is dependent largely on the lack of competition from the plants already growing in the sward. As the latter are less competitive in autumn than in spring, and as previous trials had favoured autumn sowings, it was decided to hold the demonstration at Whakamaru on 6 March 1956, when soil conditions could be expected to be satisfactory.

Treatment of the area before sowing was designed to reduce the vigour and amount of the existing vegetation as much as possible, to assist the placement of seed and fertiliser in the soil, and ensure that the seedling growth had the minimum of competition. Unfortunately it was not possible to stock at the intensity desirable, with the result that clover competition did become a factor of importance after the seed was drilled. In a season of vigorous autumn growth hard grazing may often not be feasible on a large area, particularly where dairy cows are the only stock available to eat it down. Consequently only the area which can be given this preliminary treatment should be overdrilled unless recourse is made to mechanical means of removal. Overdrilling without it is not likely to be satisfactory.

Experimental Sowings

The methods of sowing are shown in the table below. Grass seed at 7lb. per acre was sown on all plots except the control plots. Serpentine superphosphate was applied, as detailed in the table, at 2cwt. per acre on all plots. The light cultivation treatment before seeding consisted of two strokes of weighted spike tine harrows, the aim being to reduce the white clover by about 50 per cent. The heavy cultivation before seeding was done with tandem disc harrows, followed by tine harrowing, and the vegetative cover was reduced by about 90 per cent. Each plot was given one stroke with the chain harrows after seeding. Control plots were spaced among the others for later comparisons.

EXPERIMENTAL SOWINGS

Treatment No.	Method of seeding	Cultivation	Seed mixture	Fertiliser application
1.	Disc drill	Light	Short-rotation ryegrass ..	Drilled with seed
2.	Disc drill	Light	Perennial ryegrass ..	Drilled with seed
3.	Disc drill	Light	½ short-rotation ryegrass ½ perennial ryegrass	Drilled with seed
4.	Disc drill	Light	Cocksfoot	Drilled with seed
5.	Disc drill	Heavy	Short-rotation ryegrass ..	Drilled with seed
6.	Hoe coulter drill with "Blackmore" tips ..	Light	Short-rotation ryegrass ..	Drilled with seed
7.	Hoe coulter drill with "Blackmore" tips ..	None	Short-rotation ryegrass ..	Drilled with seed
8.	Australian sod-seeder ..	Light	Short-rotation ryegrass ..	Drilled with seed
9.	Australian sod-seeder ..	None	Short-rotation ryegrass ..	Drilled with seed
10.	"Wilson" tiller-seeder	Light	Short-rotation ryegrass ..	Broadcast
11.	"White" disc-seeder ..	Light	Short-rotation ryegrass ..	Drilled with seed
12.	Broadcast	Light	Short-rotation ryegrass ..	Broadcast
13.	Broadcast	None	Short-rotation ryegrass ..	Broadcast
14.	Control	None	None	Broadcast

look for the BLUE label . . .

WHEN BUYING FENCING WIRE

FIRST CLASS GALVANISING
A.Z.55/45 TYPE A
RICHARD JOHNSON & NEPHEW LIMITED
MANCHESTER ENGLAND
8
FENCING WIRE
S.W.G.
BREAKING STRESS 1391 LBS
273 YARDS MIN
56 LBS NET

Johnson's English Wire, drawn with the skill of 150 years' experience, is protected by patented Hot Dip Galvanising. This ensures long life in New Zealand's climatic conditions and it is particularly resistant to the corrosive action of salt-laden air.

Remember when fencing new Paddocks or replacing old fences, ask for and buy the best. . . .

STOCKS OF PLAIN WIRE READILY AVAILABLE

JOHNSON'S

ENGLISH FENCING WIRE

MANUFACTURED BY: RICHARD JOHNSON & NEPHEW LTD. MANCHESTER, ENGLAND.

SOLE NEW ZEALAND AGENTS:

JOSEPH NATHAN & COMPANY (N.Z.) LTD.

WELLINGTON AUCKLAND CHRISTCHURCH

SP.563A

G.9717

"Did you say 'Tropotox'?"

Yes, 'Tropotox'—the weedkiller you need for special jobs. And that means safe and effective weed control in clovers, from the first trifoliate leaf stage, cereals, from the 2-leaf stage, peas, (garden varieties).

Weeds controlled include annual buttercups, fat hen, Californian thistle, and seedling docks. 'Tropotox' is the original MCPB weedkiller, developed at the M. & B. Agricultural Research Station at Ongar, England — and now well established in New Zealand also, after exhaustive tests and a full season's practical use. Supplied in tins of 1 quart and 1 gallon, drums of 5 gallons.

'TROPOTOX'

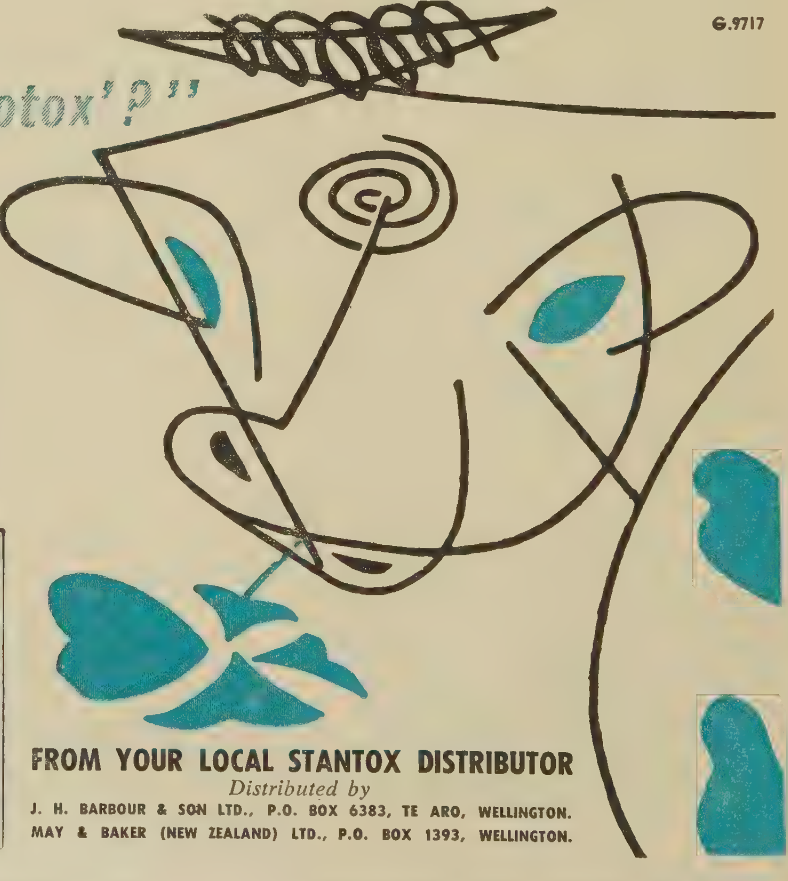
trade mark *brand*

MCPB SELECTIVE WEEDKILLER

(full strength formulation: contains 4 lb. active acid per gallon)

MANUFACTURED BY

MAY & BAKER LTD



FROM YOUR LOCAL STANTOX DISTRIBUTOR

Distributed by

J. H. BARBOUR & SON LTD., P.O. BOX 6383, TE ARO, WELLINGTON.
MAY & BAKER (NEW ZEALAND) LTD., P.O. BOX 1393, WELLINGTON.

Machines Used

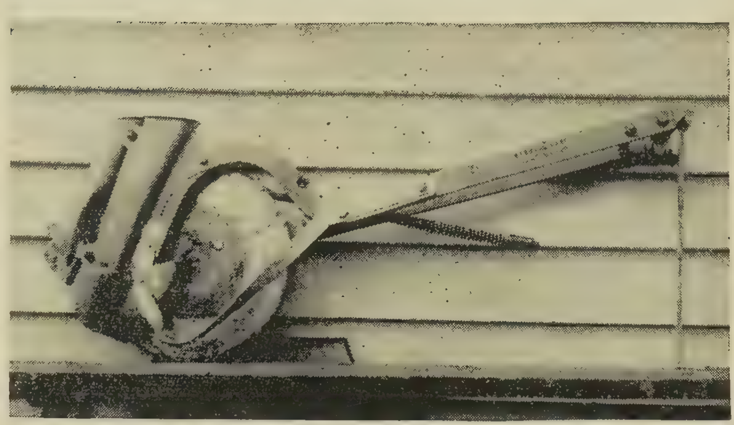
The **disc coulter drill** (treatments 1 to 5) was a standard machine equipped with separate seed and fertiliser boxes. Separate tubes were used to guide the seed and fertiliser into the grooves left by the discs. The seed was sown in the bottom of the groove and in friable ground was covered by a little soil before the fertiliser was deposited. The disc coulters were each fitted with a depth-limiting skid (see illustration on this page). Thus, sufficient spring pressure could be applied to the coulters to ensure constant penetration without the discs penetrating too deeply.

The **hoe coulter drill** (treatments 6 and 7) was a standard old-pattern grain drill. "Blackmore" grassland tips were fitted to the coulters, but their real worth was masked by the poor mechanical condition of the drill.

The **Australian sod-seeder** (treatments 8 and 9) comprised a seed and fertiliser box mounted on a tractor-mounted cultivator (see illustration on this page). Special designed furrow-opening shoes were fitted to the cultivator tines, which each incorporated a stump-jump mechanism. This machine, now in production in Australia, was the outcome of research work at Sydney University into the problem of introducing clover into paspalum pastures. The machine used in these sowings had been donated by the manufacturers to Massey Agricultural College for research work on overdrilling in this country.

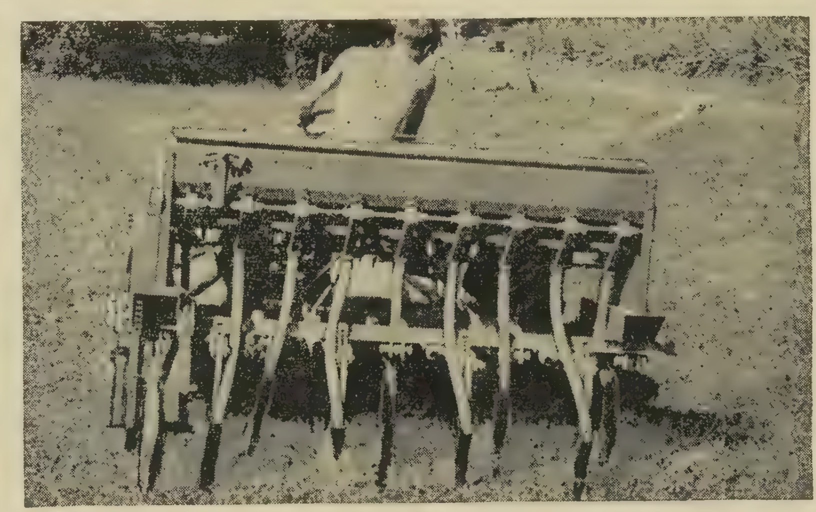
The **"Wilson" tiller-seeder** (treatment 10) comprised a tractor-mounted tine cultivator to which had been added a grass seed box and a pair of depth wheels (see illustration on this page). Narrow "lucerne-renovating points replaced the usual 2in.-wide chisel points. The owner, Mr. W. G. Wilson, of Tokoroa, who designed and constructed it, plans to add a fertiliser box for next season.

The **"White" disc-seeder** (treatment 11) was based on a prototype developed at Massey College and consisted of a fertiliser distributor mounted on top of a single gang of trailed outcut discs (see illustration on page 287). Depth-limiting wheels had been fitted between the second and third blades from each end so that increased "cut" could be applied without excessive

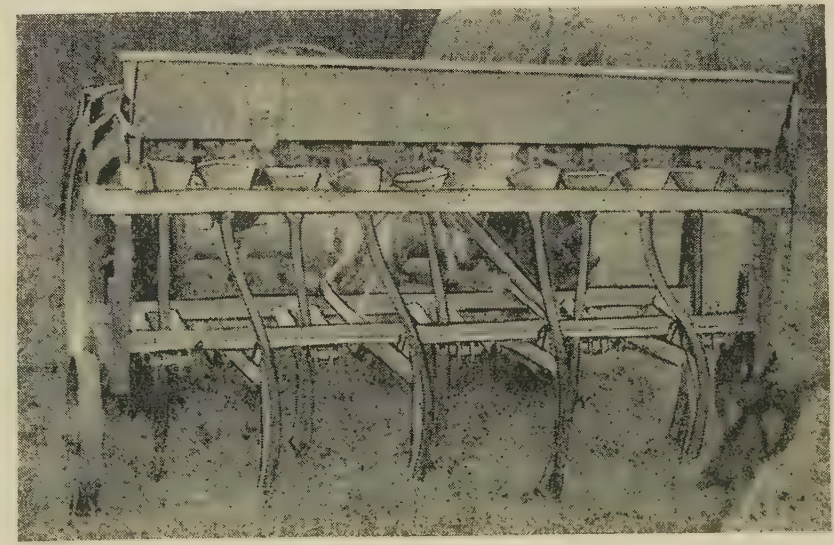


This type of depth-limiting skid when fitted to a disc-coulter drill prevents excessive penetration in soft patches while allowing full spring pressure to be applied. Thus an even-depth furrow is assured.

Overdrilling a dairy farm pasture → with the Australian sod-seeder used in the trial. This field was grazed for a further 10 days after sowing to reduce competition from existing species.



The "Wilson" tiller-seeder. The → results obtained with this machine were clearly discernible throughout the trial, and the vigorous growth of ryegrass sown with it is attributed to the reduction of local competition caused by the tines, which were fitted with lucerne-renovating tips. Seed only was sown, but it is planned to attach a fertiliser box as well for the coming season.



FOR SPEED

PACK GOODS IN EASILY HANDLED

JUTE BAGS

•

The textured surface, the positive 'grip' of jute bags makes for faster, surer handling, more stable stacking by men or machines in all weathers. Jute bags are stronger — more practical and satisfactory for a wide range of goods — reusable — resaleable — and, most important, they cost you less.

•

Inquiries to

INDIAN JUTE MILLS ASSN.
P.O. Box 90, Dunedin.

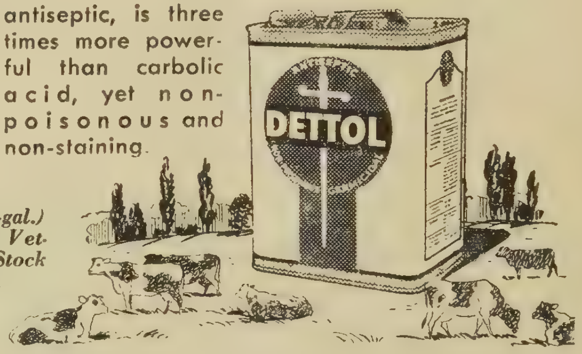
Use safe and reliable

'DETTOL'

THE MODERN ANTISEPTIC

FOR STOCK . .

Dettol, the modern antiseptic, is three times more powerful than carbolic acid, yet non-poisonous and non-staining.



In tins (½ and 1-gal.) from your Chemist. Veterinary Clubs or Stock and Station Agent.

Reckitt & Colman (N.Z.) Ltd., Pharmaceutical Division, Forth Street, DUNEDIN

ORDER NOW!

BELGIAN

BASIC SLAG

GUARANTEED **18-22%** Phosphatic Acid Content (P_2O_5)

GUARANTEED **80-90%** Citric Soluble

AND LOOK AT THE "EXTRAS" YOU GET WITH BELGIAN BASIC SLAG

The citric acid test for phosphate solubility approximates the action of soil acids. 80-90% soluble means that Belgian Basic Slag is quick acting, besides having the residual effect you associate with slagging.

In addition to soluble phosphates, every cwt. of Belgian BASIC SLAG supplies the equivalent of I cwt. of lime, PLUS many minor minerals needed both by plants and livestock. Among these are magnesium, manganese, iron, copper, molybdenum, and cobalt.

penetration of the discs. Tubes guided the mixed seed and fertiliser into the grooves left by the discs. The machine had been designed and constructed by the joint owners, Messrs. R. White and J. Morton, of Atiamuri.

Broadcast sowings (treatments 12 and 13) and all fertiliser broadcasts were made with the disc coulter drill from which the coulters and tubes had been removed. Drill settings remained unchanged.

After Treatment

Conditions at the time of sowing were good for establishment. The soil was moist and suitable for rapid germination and the temperature mild. These conditions were ideal for the quick recovery of the clover and it was decided to continue grazing the plot area for 10 days after sowing. To continue grazing longer than this would have damaged the young seedlings unduly. Previous experience had shown that the new seedlings must not be defoliated until they are well established, even though it appears that the clovers and grasses of the old sward are offering strong competition. Generally the damage done by a premature grazing is greater than the weakening effect of competition.

Growth on the plots was very vigorous in March and April and almost completely overtopped the sown species. The latter, however, survived quite well, but it is known now that a more severe grazing beforehand as well as a more vigorous surface cultivation would have been of advantage in this district.

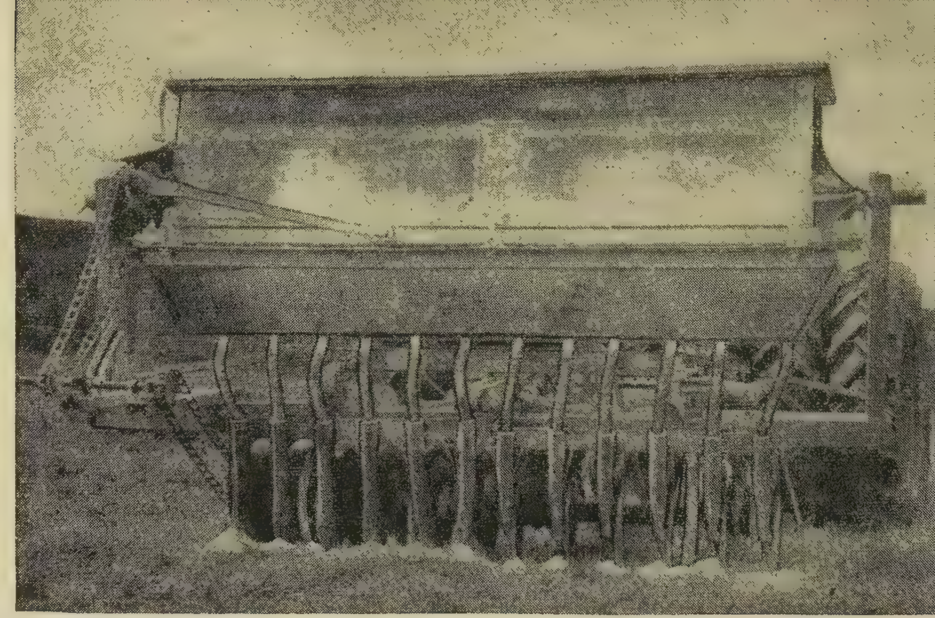
Results

The plots were kept under observation by Mr. D. Tong and were inspected by the writers in May and October. At the first inspection the strong autumn growth masked the differences between most of the treatments, but the machines and treatments which had done most damage to the turf seemed to have given the best results at this stage. These were the "Wilson" tiller-seeder and the Australian sod-seeder, and the heavy cultivation treatment sown with the disc drill.

A more detailed inspection was made on 17 October 1956, at which stage the field had been spelled for about 3 weeks. The vigorous regrowth of the introduced ryegrass where it had become thoroughly established was quite discernible.

Short-rotation ryegrass proved more vigorous than the other grasses in the first 6 months. Perennial ryegrass was also firmly established, but because of its slower establishment and growth it was less noticeable. Cocksfoot had been well shaded by the vigorous regrowth of clover, but was still hanging on and appeared capable of becoming well established later.

The heavy cultivation treatment was disappointing because of the uneven establishment of the short-rotation ryegrass. A heavy and vigorous regrowth of clover had occurred despite the fact that most of the old sward had been destroyed by cultivation.



The "White" disc-seeder. Seed and fertiliser are mixed together and then sown through the distributor mounted above the discs. Tubes guide the mixture into the grooves left by the slightly angled discs. The wheels placed between the second and third blades at each end prevent excessive penetration, even though the disc blades may be angled sufficiently to scoop out an almost clean groove.

The light cultivation treatment in conjunction with the hoe coulter drill (treatment 6) and the sod-seeder (treatment 8) resulted in better establishment and growth of the sown species than did the sowings by the same machines on the uncultivated sward (treatments 7 and 9).

Of the methods of sowing used, broadcasting the seed and fertiliser, even where a light cultivation had been given (treatment 12), resulted in the poorest establishment of grass plants. In contrast, the thickest and most uniform establishment was obtained from the "Wilson" tiller-seeder (treatment 10). This plot had been the most prominent throughout the whole period under observation.

The two drills following light cultivation (treatments 1 and 6) gave rather similar results, the uniformity resulting from the disc drill being slightly superior to that from the hoe coulter drill. Both, however, failed to reach the evenness of the best plot (treatment 10).

Patchy development of short-rotation reygrass occurred in the plots sown with the Australian sod-seeder and the "White" disc-seeder.

Comments and Conclusions

The ability of short-rotation ryegrass to establish quickly from seed is of special value where competition in the early stages is severe. On the other hand experience has shown that it requires more favourable moisture conditions and a higher soil fertility than perennial ryegrass. Where there is some doubt about the suitability of the area to be overdrilled, a mixture of the two grasses can be used. Cocksfoot is a useful grass on pumice soils and more information should be obtained on its performance when overdrilled.

Where grass seed is drilled the sowing rate can be reduced to 6lb. to 10lb. per acre because of the better placement of the seed in the soil and its restricted distribution through being sown in rows; 8lb. of ryegrass seed per acre gives a seeding of between two and three seeds per inch of rows spaced 7in. apart, and, even allowing for only a 50 per cent. establishment, should still provide enough plants to give a grass-dominant sward.

It is considered that time and money should not be spent on overdrilling grass seed in soils that are not in good heart. Fertility build-up on pumice soils can occur rapidly if clovers are encouraged and are well utilised by efficient grazing of the young pastures. It is advisable to delay overdrilling until the build-up has reached a stage at which the introduced grasses will be adequately fed. The time when this stage will be reached may be difficult to forecast, but is indicated by an increase in the proportion of grasses to clovers in the pasture. Cocksfoot and Yorkshire fog are usually the active grass indicators.

The pre-cultivation of the sward appears to be an easy way of reducing the competition of established plants, but is not so valuable as severe grazing as a preparation for overdrilling. Cultivation still leaves the vegetation on the ground and this interferes with seeding and establishment. The relatively poor results of the heavy cultivation were probably due to two factors. First, the discs disturbed the soil to a depth of 3in. or 4in. and left it unconsolidated. Secondly, they brought to the surface on many parts of the plot much raw pumice, and the seed was not placed in the black organic matter of the surface layer. Confirmation of the effect of this was obtained from small plots sown previously with different grasses. The ground was uneven. In some places the black topsoil extended the full depth of the spade; in others it was only an inch or two deep. The early growth of the grass seedlings was much greater in the former sites than in the latter.

The establishment from the Australian sod-seeder was very patchy. The furrow opened by this machine is formed by the bursting of the turf and by the sideways compression of the soil rather than by removal of a strip of turf. As a result, in this loose, friable pumice soil the furrow healed over quickly and the introduced seed was readily smothered by the vigorous clover. Also, being a rigid-framed machine it could not follow the surface irregularities, with the result that only 2 or 3 coulters were sowing at the correct depth at one time—the remainder were either too deep or not touching the ground at all.

Results from the "White" disc-seeder were also poor on the plot areas, though very good results were observed where the machine had continued sowing on the way to the loading bank. Because of the construction of the seed and fertiliser delivery mechanism it is necessary to run this machine for some distance before an even flow from the seed tubes is assured. It is thought that as the machine was filled just before sowing the plot area, it would not have been sowing properly until the run was almost completed. Performance therefore could not be fairly judged from the plot area, but the good establishment noted on the trip from the field suggests that it has much merit.

The performance of the two drills would have been improved had the area been more closely grazed. The addition to the disc drill of a skimmer (similar in type to that used on a plough) fitted to each disc would assist materially in leaving a wider plant-free furrow. In both cases it is thought that the unevenness of establishment was due to the competition from the established clovers which were not sufficiently repressed by the prior grazing, the light cultivation, or the action of the furrow opener. Though these machines both used independently mounted coulters, the range of vertical movement was insufficient at times to cope with the uneven ground. The need is stressed for each coulter on an overdrilling machine to have free vertical movement of up to about 12in. or more. The rate of wear of the "Blackmore" tips in abrasive soils is high, even though the points are hard faced; thus this method would be more suited to a farmer overdrilling a small area each year than to a contractor who may overdrill upward of 2000 acres per year.

Though the "Wilson" tiller-seeder is a rigid-framed machine and did not sow fertiliser with the seed, it still gave the most successful results. The reason is attributed to the following:—

(a) The narrow points were set to cut about 2in. deep on level ground. Where a high spot was encountered by some of the tines they cut through at considerably increased depth without lifting the remainder of the tines out of the ground. Because of the narrow cut the seed did not fall to the bottom of the furrow but remained near the surface, where it was covered by the chain harrowing. Some gaps in the established plants were noticed, mainly where there was a hollow and the tines had not penetrated.

(b) The points, though narrow, formed their track by tearing the sward apart. This resulted in the clover being torn away in some cases up to 2in. to 3in. from each side of the coulter. There was sufficient clearance between each tine to allow the trash free passage.

The almost complete failure of the broadcast treatment (treatment 13) is in line with previous experience. An improvement was noted on the lightly cultivated plot (treatment 12), but even this was considerably poorer than the other treatments. Unless the seed can fall on to the soil it has little or no chance of survival. A more drastic harrowing or surface cultivation would assure this and provide a greater check on the established species. But this would require a considerable increase in time to prepare the field and heavier seeding rates would be required to allow for the inevitably higher mortality.

The cost of overdrilling, if good results are regularly obtained, is such that the operation could be repeated economically every year if necessary. On the average, seed should not cost more than 10s. per acre and contract rates for overdrilling should be about £1 per acre. The number of plants that established in the best treatments indicates that about 6lb. to 8lb. of ryegrass seed per acre is sufficient to ensure a desirable grass-clover balance.

The observed results of the sowings confirm the need for overdrilling machinery designed to cope with the requirements dictated by soil, vegetative, and climatic conditions prevailing in this country. None of the machines used fulfilled all requirements and consequently the trial sowings were not uniform. As sections of the treatments were good—in some cases excellent where the requirements had been fulfilled for short lengths—there seems to be no reason why uniformly good results could not be expected if such machines were available.

◆

Dairy Produce Graded for Export

THE following figures showing quantities of dairy produce graded for export during June 1957 and for the 11 months ended 30 June 1957 with comparative figures for the same month and 11 months of 1955-56 have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:—

BUTTER

Period	Creamery (tons)	Whey (tons)	Total (tons)	Percentage inc. or dec.
June 1957	332	11	343	—
June 1956	526	19	545	—
Increase or decrease	—194	—8	—202	—37.064
11 months ended 30/6/57	151,989	2,904	154,893	—
11 months ended 30/6/56	159,881	2,955	162,836	—
Increase or decrease	—7,892	—51	—7,943	—4.878

Butter in store at 30 June 1957 was 19,403 tons

Note: In the 3 months January-March 3990 tons of ice cream base were graded for export at Auckland, but not included in butterfat figures.

CHEESE

Period	White (tons)	Coloured (tons)	Total (tons)	Percentage inc. or dec.
June 1957	947	3	950	—
June 1956	1,478	—	1,478	—
Increase or decrease	—531	+3	—528	—35.724
11 months ended 30/6/57	79,786	10,357	90,143	—
11 months ended 30/6/56	79,396	12,702	92,098	—
Increase or decrease	+390	—2,345	—1,955	—2.123

Cheese in store at 30 June 1957 was 18,212 tons

If these figures are converted into butterfat equivalent, there is a decrease of 4.318 per cent. in butterfat graded for the 11 months as compared with the corresponding period of the preceding season. The above figures refer only to butter and cheese graded for export, and owing to diversions which may take place from time to time they are not necessarily a true indication of production trends.

Convenient Type of Pot Dip

By G. L. WICKENDEN,

Sheep and Wool Instructor, Department of Agriculture, Wellington

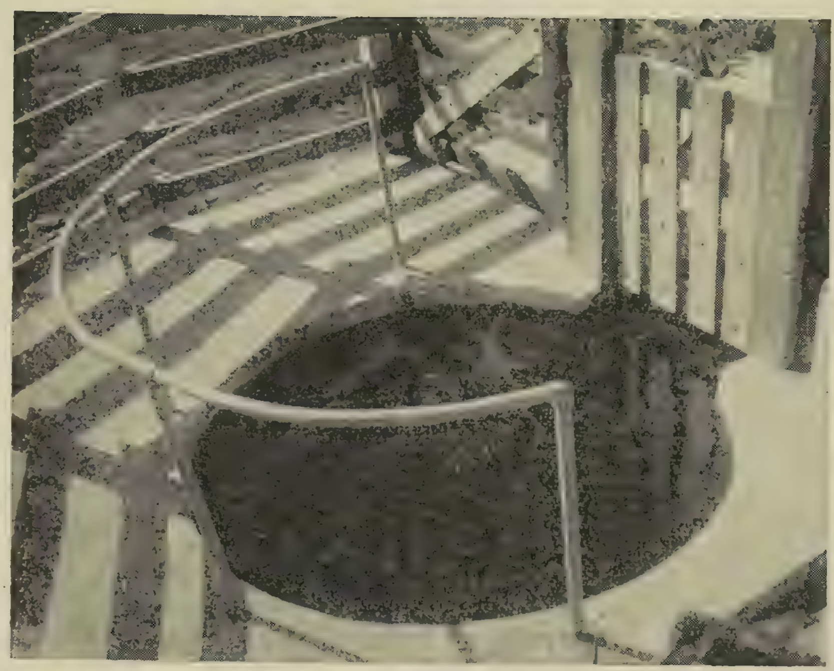
A CONVENIENT type of pot dip has been built on the property of Mr. E. Ellis, "Benhar", Ponatahi, Carterton. A farmer should have no difficulty in dipping sheep on his own in one of these dips if other labour were not available.

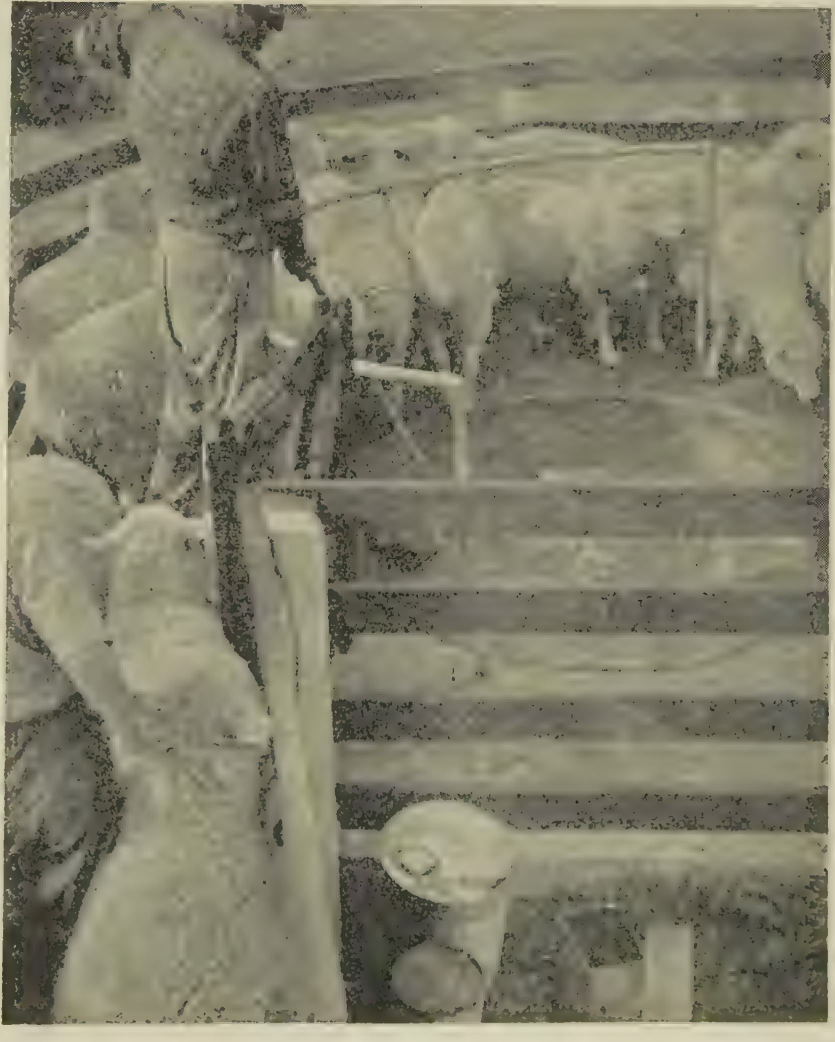
THE approach to the dip is by two tapering crush pens leading from the sheepyards to a 3ft.-wide platform or apron which extends round the dip and which holds approximately 16 big Romney ewes. This platform has a 1in. in a foot slope toward the dip. A gate at the far end of the platform gives access to paddocks. This allows for pre-dipping training of sheep if they ever become difficult to get in and is useful for drafting when the foot-rot bath is being used.

A 2ft. 9in.-high railing made from 1in. galvanised piping runs round the edge of the dip. This rail is supported at intervals by four pipes embedded in the concrete approximately 4in. from the edge of the dip. The rail is a protection and a help to the man putting the sheep into the dip.

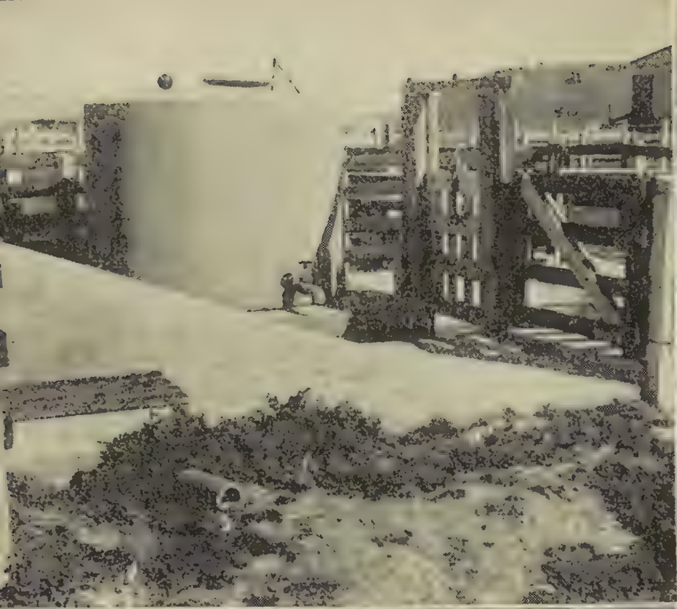
A lift-up, counter-weighted gate gives access by way of a 2ft. 6in.-wide ramp to the draining pens. The draining pens are each 23ft. long and 10ft. wide and each holds approximately 60 to 70 Romney ewes. These pens drain into a sump 2ft. 10in. long, 2ft. wide, and 1ft. 5in. deep which filters out impurities before the dipping fluid returns to the dip.

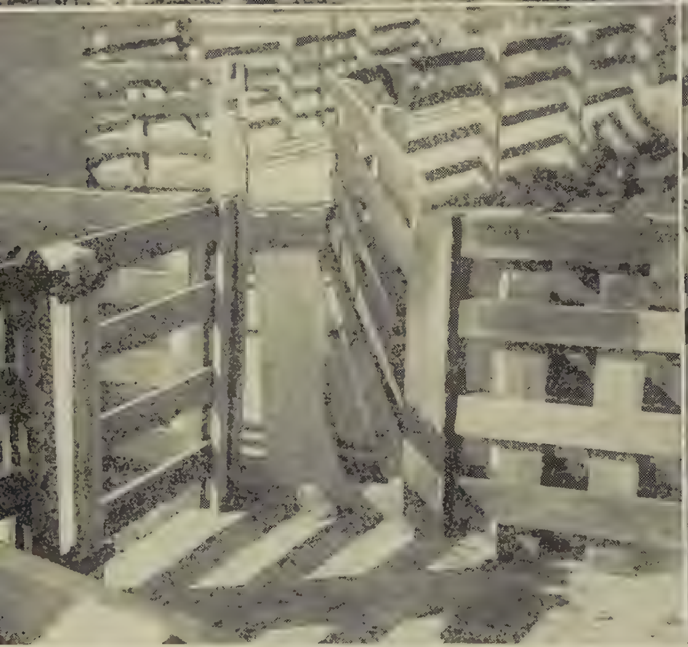
The pot dip is 6ft. across at the top, tapering to approximately 3ft. 4in. at the bottom, is approximately 5ft. 10in. deep, and holds 1000 gallons when full. As the dip has no anti-splash lip, dipping is carried out from the 800-gallons mark down to approximately 400 gallons. Beside the dip a 600-gallon concrete tank fitted with a large 2in. valve supplies water for replenishment.

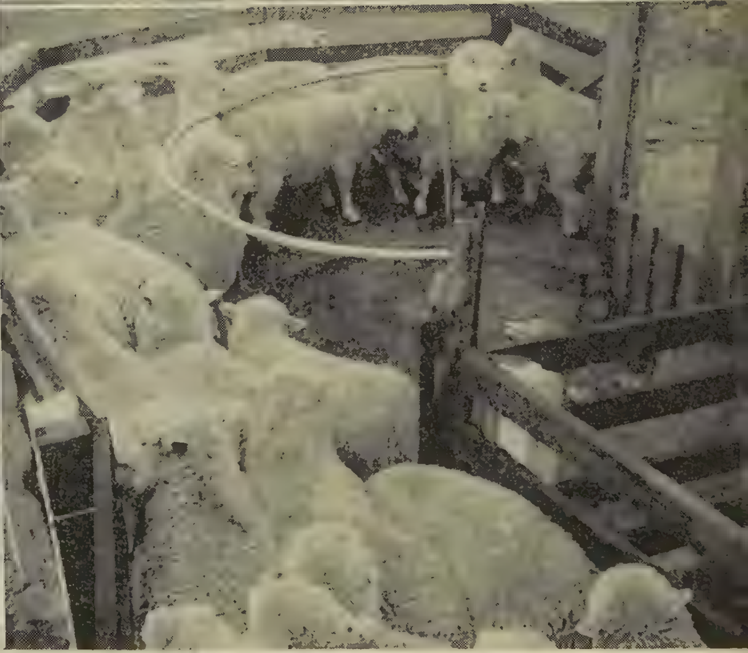




UPPER—The pot dip on Mr. E. Ellis's → property at Ponatahi, Carterton. The pipe railing round the edge of the dip is 2ft. 9in. high and is made from 1in. galvanised piping. LOWER—The dip in use. This illustration shows how the rail is a protection for and a help to the man putting the sheep into the dip. The sheep round the concrete apron or platform act as decoys to those entering from the crush pens.





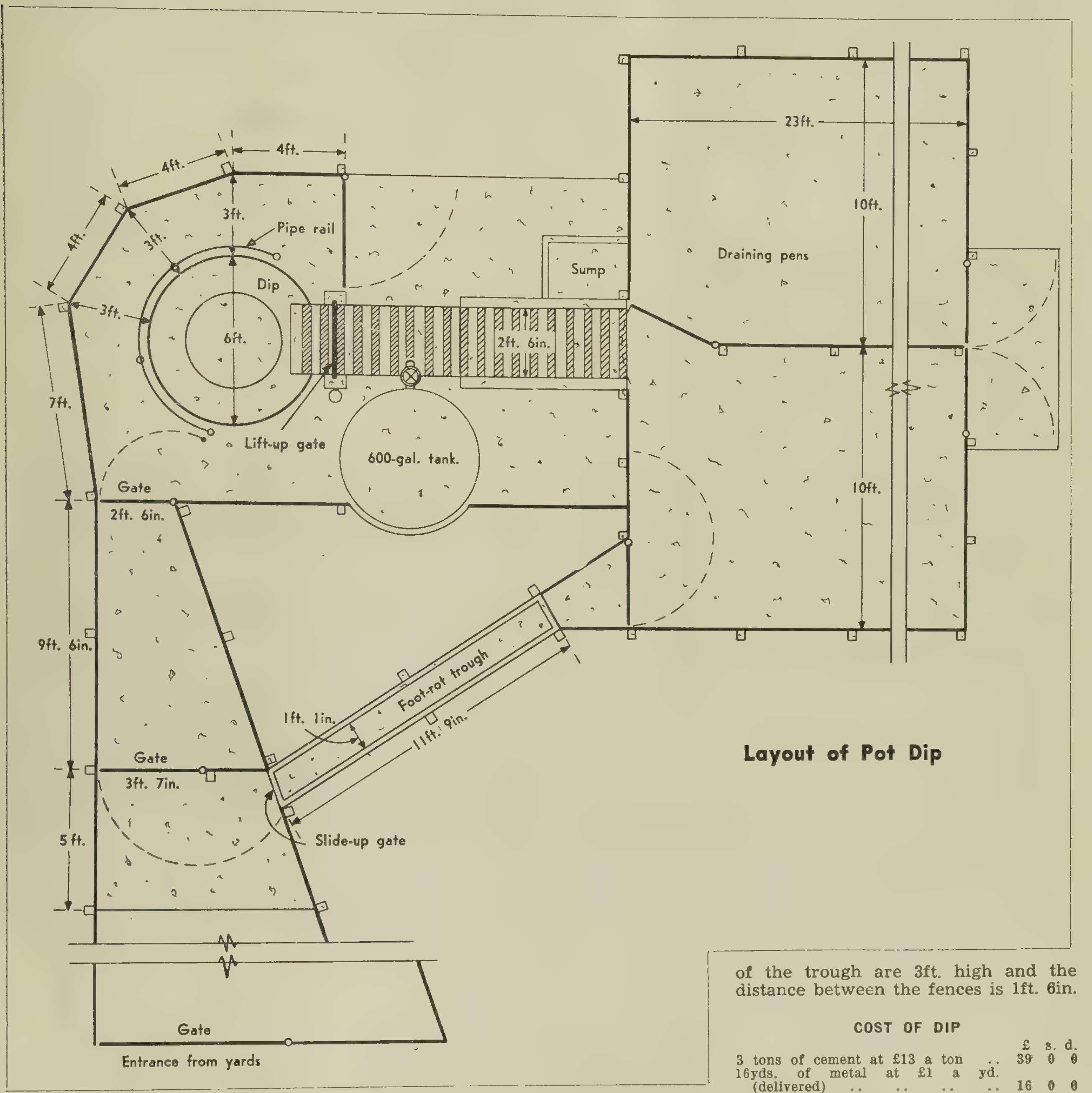


UPPER LEFT—This 600-gallon concrete tank is fitted with a large 2in. valve and supplies water for replenishing the dip. UPPER RIGHT—The lift-up, counter-weighted gate which gives access by way of a ramp to the draining pens.

MIDDLE LEFT—The foot-rot trough, which leads from a crush pen to a draining pen. The trough is 1ft. 1in. wide at the bottom. MIDDLE RIGHT—The pot dip in use. The dip holds from 4 to 6 sheep. The counter-weighted gate is lowered to close the exit from the dip.

BOTTOM—The draining pens, with the ramp from the dip in the foreground. Each draining pen holds approximately 60 to 70 Romney ewes. The pens drain into a covered sump which filters out impurities from the dipping fluid before it returns to the dip.

A CONVENIENT POT DIP


4ft.
4ft.
4ft.
3ft.
3ft.
3ft.
Pipe rail
Dip
6ft.
23ft.
10ft.
Draining pens
Sump
2ft. 6in.
7ft.
Lift-up gate
600-gal. tank.
10ft.
Gate
2ft. 6in.
9ft. 6in.
Foot-rot trough
1ft. 1in.
11ft. 9in.
Gate
3ft. 7in.
Slide-up gate
5 ft.
Gate
Entrance from yards

Layout of Pot Dip

A 7in.-high curved lip of concrete surrounds the draining pens. A 3ft.-wide apron of concrete outside the 3ft. 2in.-wide exit gates from these pens prevents wear. Concrete posts and four 4in. by 1¼in. red birch rails have been used for all the fences, which are 3ft. high.

The sheep are easily kneed or backed into the dip one at a time; rough handling is not necessary. The dip holds from 4 to 6 sheep. As the operator is working with the sheep nearest the entrance the ones farther round the apron or platform act as decoys to those entering from the crush pens.

It would be an advantage and would give a wider and an unimpeded space for putting sheep into the dip if the pipe guard rail round the edge of the dip were supported by three pipes rather than by four.

Foot-rot Trough

A foot-rot trough leads from a crush pen to a draining pen. This concrete trough is 11ft. 9in. long, 1ft. 1in. wide, and 3in. deep. The fences on each side of the trough are 3ft. high and the distance between the fences is 1ft. 6in.

COST OF DIP

	£	s.	d.
3 tons of cement at £13 a ton ..	39	0	0
16yds. of metal at £1 a yd. (delivered)	16	0	0
1yd. of sand at £2 5s. a yd. (delivered)	2	5	0
A 600-gallon concrete tank	23	10	0
Cartage of tank	4	0	0
40 concrete yard posts	25	0	0
Gate hinges	6	0	0
Timber rails, 1¼in. by 4in. (red birch)	25	0	0
1in. galvanised pipes for guard rail and supports round dip and 2in. valve for water tank	6	10	0
2cwt. of ⅜in. reinforcing	4	0	0
Contract and farm labour	90	0	0
Boxing—mostly recoverable for other work	10	0	0
	251	5	0

(All concrete work was done by a contractor. Farm labour for fencing and other work was estimated at approximately £20).

Take the drudgery out of Dairy Shed cleaning with

Delak No. 2 is a balanced combination of blended alkalis and the Shell master detergent Teepol. It is designed to give maximum cleaning efficiency under actual operating conditions in milking shed or factory.

Delak No. 2 gives these advantages:

- *No mixing or measuring required.*
- *Easy and pleasant to use.*
- *Unaffected by hardness or acidity of water.*
- *Does not lose effectiveness when water temperatures drop.*
- *Rinses freely, leaving surfaces clean and free from residues.*

At all times and in all conditions Delak No. 2 is the best cleaning agent for dairying equipment.

DELAK *No. 2*

'Delak No. 2' and 'Teepol' are SHELL products.

D1.6

You can even Brand them Wet..

Yet another Elliott triumph. FIRST with practical liquid phenothiazine —FIRST with easy oesophageal drenching—**NOW** the firm with a branding fluid that does everything the Farmer wants!

NOTE THESE SPECIAL POINTS:

- **WILL NOT RUN IN THE RAIN**
- **SCOURS RIGHT OUT**
- **COMPLETELY LEGIBLE**
- **REMAINS CLEAR AND SHARP**
- **ENSURES TOP WOOL PRICES**

YOU CAN BRAND SHEEP WET

SCOURS RIGHT OUT

WON'T RUN IN THE RAIN

Elliotts BRANDING FLUID

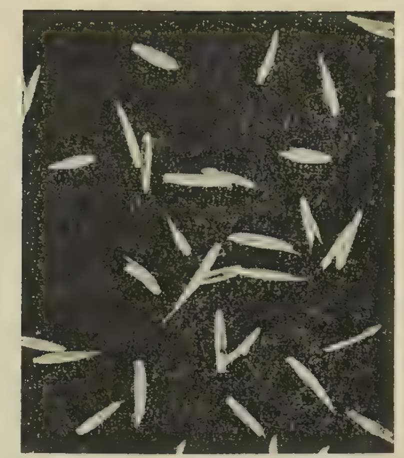
FROM YOUR USUAL STOCK and STATION AGENT

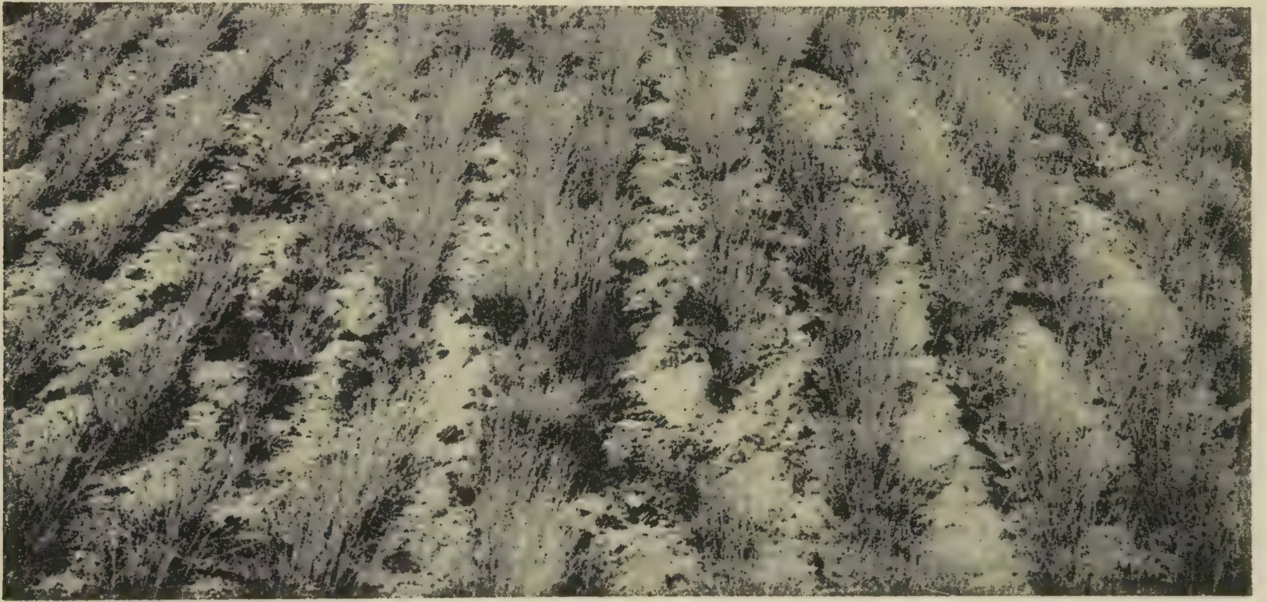
Marketed by Elliotts N.Z. Company, ELLCO LTD., Onehunga, Auckland. (A Division of D.H.A. [N.S.W.] Pty. Ltd.)

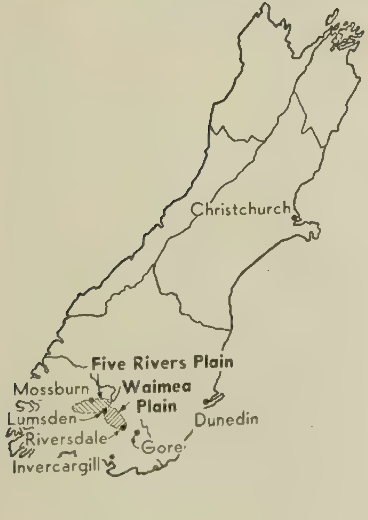
Seed Production in New Zealand
Chewings Fescue

By W. FAITHFUL,
Instructor in Agriculture, Department of Agriculture, Invercargill

THE production of the seed of chewings fescue (*Festuca rubra* var. *fallax*), though of comparatively minor importance to most farmers in New Zealand, has been regarded very differently by the producers of the major portion of the crop in Otago and Southland. The history of the production of chewings fescue seed goes back to 1880, when a farmer in the Rimu district of Southland sowed down a 2-acre paddock in grass. He was probably unaware that this common farming operation would open up a new avenue of export for primary produce which would be of considerable financial benefit to a large number of farmers in the province. The grass seed he used was later to be known as chewings fescue.


Chewings fescue seed.


▲ Renovated fescue.



← Most chewings fescue is grown in Southland, in the area shaded on the map.

THE origin of the seed that was sown is obscure. A pamphlet issued by the New Zealand Grain, Seed, and Produce Merchants' Federation, "Grasslands of New Zealand", states: "The imported seed which originally produced chewings fescue was some type of fescue grown in Europe, and it is claimed by some that the seed was dropped from grasses used to pack goods coming to New Zealand". A more likely explanation is that the seed was supplied in a lawn grass mixture obtained from Hurst and Sons, London, and that this mixture was sown by the Rimu farmer, as he required a grass that would make a dense sward quickly and would not be poached by cattle. The mixture is said to have been recommended to him by an Invercargill seed merchant. Whatever its origin, most reports about the development of the production of the seed during the years following the original sowing more or less substantiate one another.

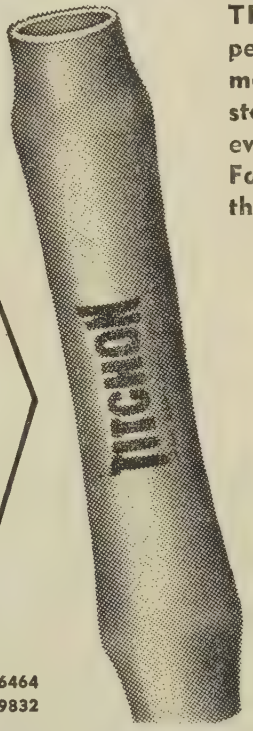
Origin of Name

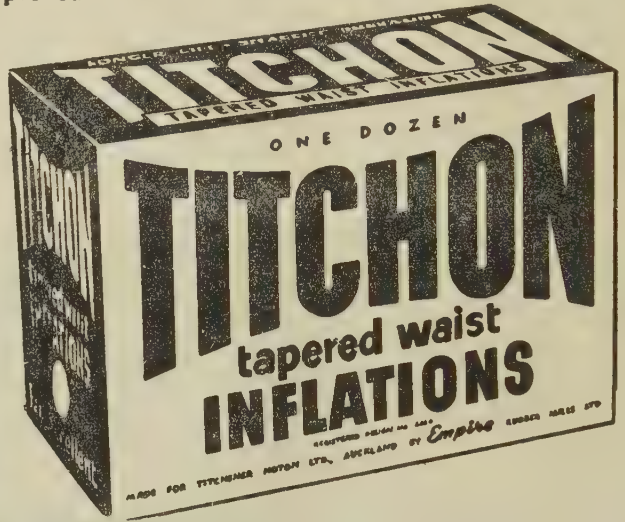
The small paddock was harvested for seed, and later some, if not all, of this seed was used for sowing in some of the paddocks on "Glenelg", a property in the Mossburn district of Southland. In 1887 that property was bought by Mr. George Chewings, and the first considerable quantity of seed, about 80 sacks, was harvested in 1890.

PROVED NEW ZEALAND'S BEST INFLATION!

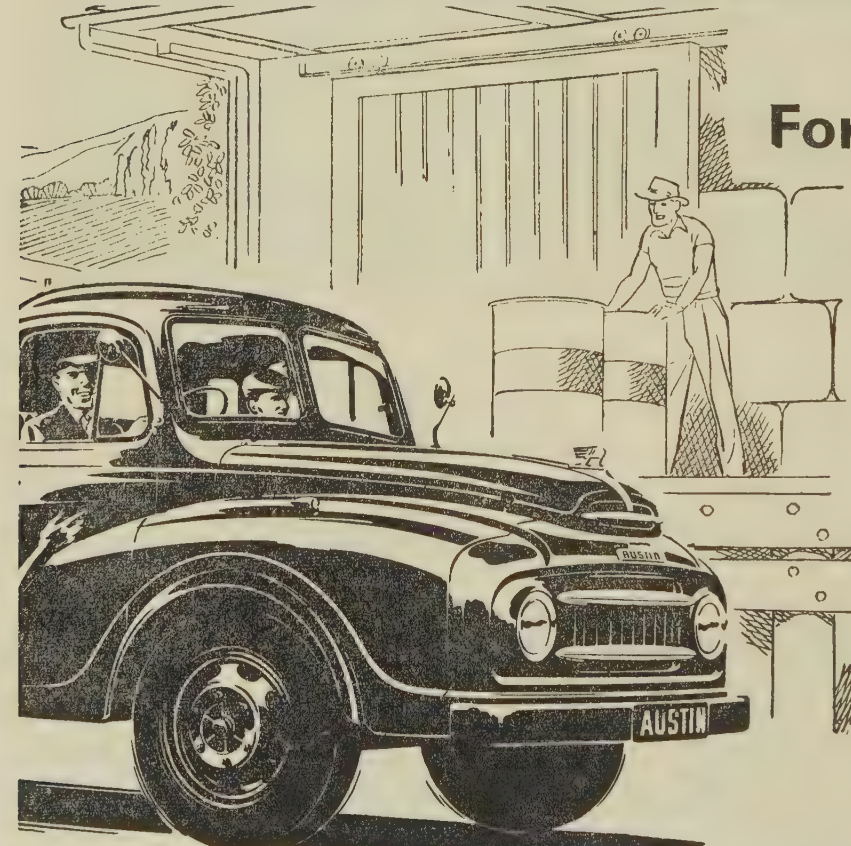
TITCHON TAPERED WAIST INFLATIONS give perfect milking. Increased sales prove that more and more farmers are using Titchon. The tapered waist stops bagginess . . . counteracts stretch . . . gives even, more constant tension . . . positive pulsation. For longer lasting 100% efficient service, fit Titchon, the proved inflation—now!

the
TAPERED WAIST
prevents bagginess




TITCHON
TAPERED WAIST INFLATIONS
ONE DOZEN
TITCHON
tapered waist
INFLATIONS
Empire
MADE FOR TITCHENER MOTON LTD., AUCKLAND BY

Regd. N.Z. Design No. 6464
Regd. Aust. Design No. 29832


AUSTIN
AUSTIN

For all Farm work

you can depend on

AUSTIN

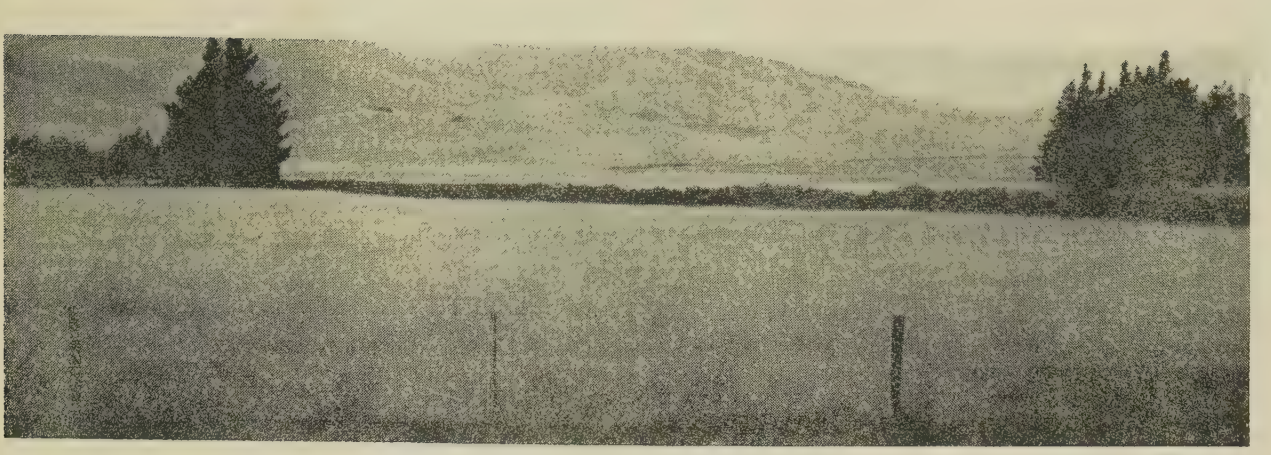
TRUCKS, PICK-UPS & VANS

AUSTIN have a vehicle for your every farm need. Their wide range includes 2, 3, 5 and 6 ton trucks available as forward or normal control, 7-tonners with forward control, A40 Pick-ups and Vans; also "152" omnitrucks and omnivans with forward control. Make enquiries today.

Distributors for AUSTIN of ENGLAND —

Auckland: Seabrook Fowlds Ltd. Hawke's Bay: Anderson & Hansen Ltd. Wellington: Magnus Motors Ltd. Taranaki: The Farmers' Co-op. Orgn. Society of N.Z. Ltd. Canterbury and Westland: David Crozier Ltd. Otago: Austin Motors (Otago) Ltd. Southland: P. H. Vickery Ltd.

PRODUCTION OF CHEWINGS FESCUE SEED



The first commercial crop of chewings fescue was grown in this paddock at "Glenelg", Mossburn.

The following year about 250 sacks were harvested and sent in for cleaning. By this time the production of the seed had attracted neighbouring farmers, and in the next season more than 600 sacks were sent to Invercargill to be dressed.

During this early period it appears that all the seed produced had been bought by one seed merchant, and with the increase in the number of producers and the larger quantities of seed some difficulty was experienced in disposing of it. However, about this time Mr. Chewings went to the North Island on holiday, and during his visit advised various runholders to try some of his fescue seed, as he thought it would probably be suitable for the pumice lands of Auckland. The result was that inquiries were received in Invercargill for samples of and quotes for "Chewings' fescue", and the seed has been called chewings fescue since then.

Export Trade

As a result of the difficulty in selling locally the increased quantity of seed produced the 600 sacks were taken over by Tothill, Watson, and Co., of Invercargill, who were agents for Sutton and Sons, Reading, England. Through the efforts of these two firms interest was aroused in chewings fescue in Britain and the foundation of an export trade was laid. However, the fame of this fescue has not been confined to Britain.

Shipments to many parts of the world have resulted in regular orders from the United States of America, the United Kingdom, Canada, Australia, France, Holland, Denmark, and South Africa. For many years Germany was also a steady importer, but after 1927 the quantity of seed sent to that country decreased remarkably, declining steadily until 1933, when export to Germany ceased. The United States of America no longer imports seed, but shipments to the United Kingdom are being maintained.

Place in Farm Practice

In earlier times large areas of land in Southland each year were sown in oats, the most profitable crop that could then be grown, but this necessitated repeated ploughing and cultivating with an attendant loss in fertility. The introduction of fescue seed production at that time was decidedly advantageous, even though the seed was sold for about 2½d. a pound at the mill. As fescue could be harvested for a number of years without the necessity for resowing, it was sown on large areas which had previously been used for growing oats. Later fat lamb production became attractive, and as much of the land which had been producing fescue seed was able to carry better-class pastures with the aid of lime and artificial fertiliser, a further change was brought about. Instead of the farms being mainly arable and fescue seed producing, more and more of them were used for sheep farming and the fattening of lambs. Because of these changes many farms were more closely subdivided and the acreage of fescue to a farm was reduced considerably.

At present any extensive blocks of fescue are mainly on land which it is considered cannot be economically raised to a sufficiently high standard for lamb fattening. However, it must not be concluded that all the fescue is produced on low-fertility land, as quite a large proportion is being grown on paddocks of comparatively high fertility, but usually these paddocks are only a very limited part of the farm. The seed is regarded as a cash crop, or, as one farmer has expressed it: "Seeding fescue on this type of land is bad farming according to present farming practice, but the return from a good crop is a good 'lift' ".

Climate and Soil

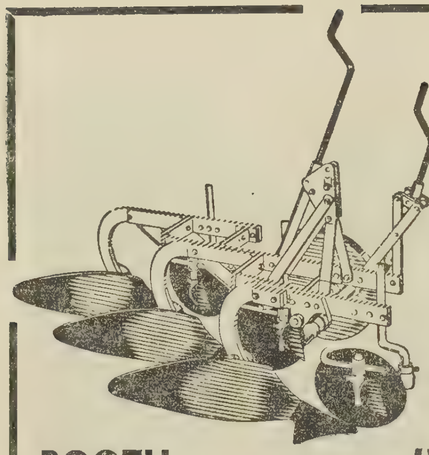
For seed production fescue requires moisture in spring and sufficient heat and moisture during summer to ensure well-developed seed of a good colour; good seed is steel blue and weighs 27lb. or 28lb. a bushel, and seed of average quality weighs 23lb. to 24lb. a bushel.

Hot, dry conditions are necessary during the short harvesting period. Soil type is also important in seed production: Very light land inhibits early establishment and vigour of the fescue and permits the ingress of undesirable weeds such as sweet vernal, hairgrass, catsear, fog, and browntop; on too heavy land the fescue sward thickens up quickly and seed production suffers in consequence. The balance between soil type and climate appears to be nicely adjusted in the central Southland district, where the bulk of the seed is grown.

The main seed-producing area is on the silt loam soils in the valleys of the Waiau, Aparima, Oreti, Waimea, and Mataura Rivers and their old courses and extensive flood plains. Almost surrounding and penetrating into the fescue country are ranges of hills and mountains, which have an important influence on the climate. Winter conditions are usually cold and bleak, but conditions in spring, summer, and autumn approximate those necessary for the production of good seed. Attempts have been made to produce fescue seed in other parts of New Zealand and overseas, but they have not been very successful, unsuitable climate and soil conditions probably contributing to failure.

Preparation of Land

Clean land is a fundamental necessity in any paddock intended for fescue seed production. The growing of cleaning crops and fallowing are advocated, though these are not always



BOOTHMAC PLOUGHS are specially designed for N.Z. field conditions and are noted for their superior construction. The range includes—2, 3 Furrow Flat Forged beam integral . . . 2 furrow semi-digger . . . Single Furrow Deep Digger . . . Single Furrow Swamp (48" x 16" mouldboard) and 24" blade Mole Drain Plough.

IMMEDIATE DELIVERY — TERMS AVAILABLE

BOOTH MACDONALD AND CO. LTD.

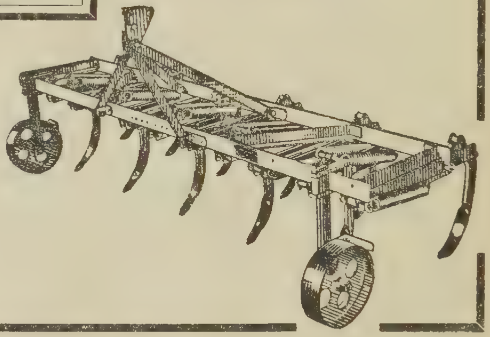
Boothmac

HEAD OFFICE:
P.O. Box 99,
CHRISTCHURCH

Dealers throughout N.Z.

For good seed beds it will pay you to invest in a BOOTHMAC CULTIVATOR. The range includes—11, 13 and 15 Tine Angle Frame models (David Brown designed) . . . 11 and 13 Tine Tubular Frame models. Full range of points and shovels.

IMMEDIATE DELIVERY — TERMS AVAILABLE



Before you buy be SURE it's . . . modernite

Polythene COLD WATER PIPE

BECAUSE it's *Polythene*, you know that it's light, flexible, corrosion-proof, inexpensive—and practically indestructible . . .

BECAUSE it's *Modernite* Polythene, you're sure it's exactly the same pipe that has been severely tested throughout New Zealand under every conceivable weather condition . . . that it is produced to an unvarying standard of excellence on modern machines . . . that it's the most efficient system of cold water reticulation science has ever devised.

MAKE NO MISTAKE ABOUT IT!

the *brand* you ask for is just as important as the material. That's why we've stamped the name "Modernite" on every foot of pipe we sell. Insist on "Modernite" Polythene Pipe.

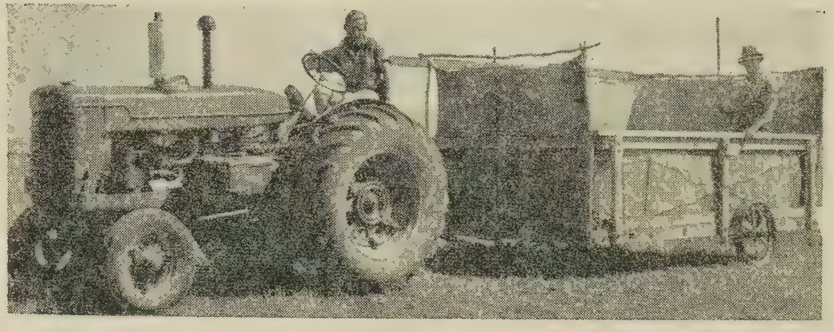
5 DIAMETERS 2 GRADES 6 LENGTHS!

Diameters: ½", ¾", 1" 1¼", 1½" 2".
Grades: Standard and Heavyweight.
Lengths: 100, 200, 300, 400, 500, 600 feet.

Manufactured by Modern Plastics (N.Z.) Ltd., Lower Hutt.
Master Distributors: A. S. Paterson & Co. Ltd., Auckland, Wellington, Christchurch, Dunedin, Blenheim. 3.6

CUT OUT AND POST TODAY
Modern Plastics (N.Z.) Ltd
Box 351, Lower Hutt.
Please send me free booklet giving full technical details and installation instructions for "Modernite" Polythene Pipe.

Name ____________________
Address ____________________
____



The type of sheaf trolley used for carting in fescue. The built-up sides protect the fescue from wind, reducing losses caused by shedding.

carried out. A true fallow permits the thorough working out of such weeds as browntop and fog, both of which tend to thicken up in the sward and suppress the fescue. A run-out fescue paddock is usually ploughed in May with a swamp plough with undercut coulters; undercutting permits the furrow to be turned over quite flat. The land should then be fallowed and have sufficient working during summer to bring couch to the surface. Ridged turnips may follow as a cleaning crop, and grain the next season.

If the paddock is clean, the fescue seed may then be sown. This should not be attempted if the paddock is still dirty, but a further cleaning crop should be sown or the land fallowed again. Fescue may be sown with or without a cover crop, but usually lamb-fattening feed such as rape or rape and turnips is used.

The seed is usually sown in November. It may be drilled in or broadcast; seeding rates are about 14lb. of machine-dressed seed an acre for drilling and 18lb. to 20lb. an acre for sowing broadcast. If drilled in, the seed is sown through every coulter; it is advisable to use old coulters to avoid burying the seed too deeply.

Management

Usually fescue is not regarded as a good pasture grass, but if it is kept short, sheep graze it quite readily. On quite a number of farms the fescue paddocks are grazed and seeded in alternate seasons. Usually this method is used on land of rather high fertility, where it is found that the grazing animals tend to control weed growth and the aggressiveness of other grasses, both of which are most undesirable in a fescue seed-producing area. By this method the fescue stand is maintained for a longer period before any renovation is necessary.

The lower-fertility areas, where the fescue blocks are usually more extensive, may be grazed or not according to the vigour of grass or weed growth, but it is advisable to run a few sheep in a fescue block to control the seeding of catsear (*Hypochaeris radicata*). The sheep keep the heads of this objectionable weed nipped off and prevent its seeding. One sheep to 3 or 4 acres is usually sufficient, and to avoid damage to the crop they are taken out about a week before the flower goes off the fescue. Ryegrass in a fescue stand is mainly controlled in the same manner. The chief objection to catsear and ryegrass is the difficulty of separating their seeds from those of chewings fescue because of their similarity in size.

Topdressing

Results from topdressing are sufficiently controversial to prevent a definite recommendation being made. Some very profitable returns have been produced by an application of sulphate of ammonia or ammoniated superphosphate, and there have also been very disappointing results; much depends on the weather after the application, as there must be sufficient moisture to ensure benefit from the fertiliser.

It would seem that best results are obtained if the application is made in early spring.

Harvesting

The harvesting of fescue requires skill, judgment, and experience, as the seed is very easily shaken. One of the disadvantages of the fescue country is that strong westerly gales during harvest time make the saving of the crop somewhat hazardous.

In an average season cutting is done in December, and the work must begin as soon as there is any evidence of the developed seed falling when touched. To secure a good sample it is necessary to permit the seed to be as ripe as possible before cutting it; the need for skill and judgment is obvious, and speed is essential.

Binder Cutting and Heading

Fescue is usually cut with the binder; direct heading, though it has been done, is not common. For direct heading, the crop has to be left until

Fescue in stook on Five Rivers Plain, Southland.

TOPDRESSING

Munro "Triumph" Topdresser

GREAT SAVING!

Cut down on your Topdressing expenditure. No method can compare with Tractor-trailer and the

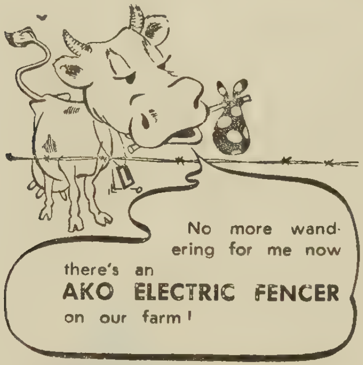
MUNRO "TRIUMPH" TOPDRESSER

Topdresser attached, as a lime and fertiliser spreader. At 10 miles an hour, an acre is covered in 3½ minutes.
Obviates buying three machines. It will:—

(1) SOW SEEDS
(2) FERTILISER AND/OR LIME
(3) MIX FERTILISERS and/or LIME

Send for free booklet!

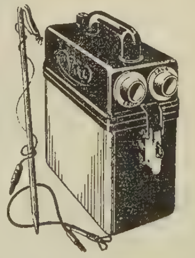
J. M. McCROSTIE
N.Z. Distributor:
P.O. BOX 67, INVERCARGILL


No more wandering for me now there's an AKO ELECTRIC FENCER on our farm!

- EUROPE'S LEADING FENCER
- GUARANTEED FOR 2 YEARS
- EFFECTIVE SHOCK
- LIGHT BATTERY DRAIN
- OPERATES FROM WET OR DRY BATTERY

See them at your dealer ask for them by name — **AKO.**

PRICE: £14 - 19 - 6



Distributed throughout N.Z. by
HAMER ELECTRICAL CO. LTD.
Auckland, Wellington, Christchurch
Dunedin
N.Z. Agents: Hooker & Co. Ltd.,
Panmure

CUT SUBDIVISION COSTS!

Enquire now about

THE HUNTER FENCING SYSTEM

Write for illustrated leaflet to:—
BETHUNE & HUNTER LTD.,
P.O. BOX 2637, WELLINGTON.

An announcement from the N.Z. Department of Health

HYDATIDS

is a disease shared by young children and farm animals. Both are infected from DOGS. ● *It attacks about 200 people every year; kills from 10-20.* ● *It wastes farmers' money to the tune of £1½ million of condemned meat a year.* ● *It is preventable. It could be stamped out if dogs were freed of hydatid worms and kept free. In the vicious cycle of hydatid infection there are two vital points at which the disease can be checked:—*

1 . . . *dog eats infected raw offal . . .*

cut cycle here by boiling all offal

you feed your dogs. Otherwise bury it. Dispose of stray carcasses around the farm. If your dog is allowed to eat the raw offal of farm animals, he develops, in seven weeks, hydatid worms which produce 500-600 eggs every few days. Dogs' excreta exposes the eggs . . . and so infection continues . . . to farm, animals, and human beings.

2 . . . *dog expels hydatid eggs . . .*

cut cycle here by dosing your dogs

every three months with Arecoline. This will kill the worms. The purge must be burned, buried or disinfected because the eggs are only expelled, not killed by the drug. Animals and humans absorb hydatid eggs.

PRECAUTIONS FOR FARM FAMILIES

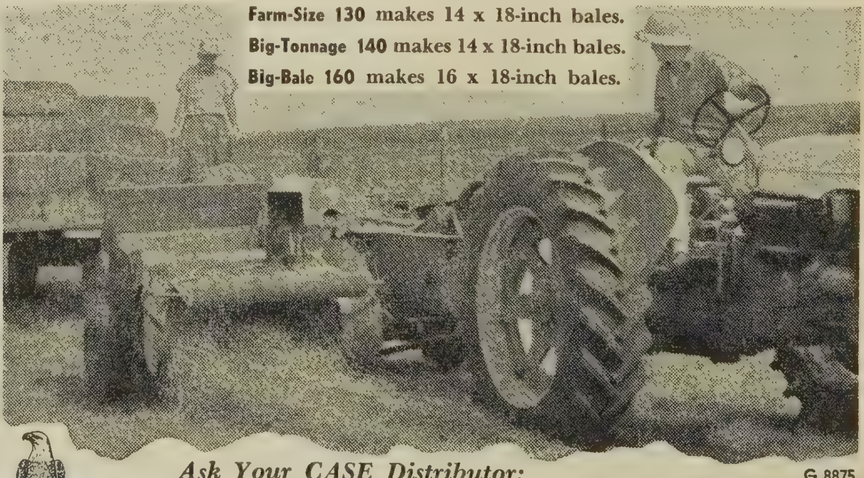
Wash thoroughly all fruit and vegetables eaten raw. ● After handling animals, never put hand to mouth without washing. ● Be sure children wash hands before eating. Remember hydatid infection usually starts in childhood.

Your co-operation on hydatid control is urgently needed.

5.7a

It Costs Less to Bale with **CASE**®

Case Balers get their tremendous capacity and strength from proved design rather than from costly size and weight. Too, they are famed for their positive tying and big capacity. That is why Case balers often out-perform heavier machines. You get a steady stream of firm, neat, *sliced* bales, tied *automatically* with twine or wire. Case sliced bales are easy to feed without shattering and losing precious protein-rich leaves. Shippers prefer Case bales with their firm neatness and strong ties for stacking and shipping. Choose the Case baler model that fits your needs, with thrifty engine or economical power take-off drive.



Farm-Size 130 makes 14 x 18-inch bales.
Big-Tonnage 140 makes 14 x 18-inch bales.
Big-Bale 160 makes 16 x 18-inch bales.

Ask Your CASE Distributor:

G.8875

NATIONAL MORTGAGE AND AGENCY CO. LTD., Dunedin, Oamaru, Timaru, Waimate, Ashburton, Christchurch and Hokitika.
J. G. WARD & CO. LTD., Invercargill and Gore.
C. W. PARKER & CO., Blenheim.
SHUTTLEWORTH BROS. LTD., Wakefield, Nelson.
North Island: FARM SPECIALITIES LTD., 100 Park Road, Auckland.

it is almost dead ripe, which is inadvisable, as a strong wind at that stage is likely to shake all the seed. If heading is done too early, the seed will heat in the sacks.

The crop is stooked immediately after the binders have passed, remains in stook for about 3 weeks, and, if possible, is threshed out of the stook. As the seed sheds very easily at this time, special care is necessary when forking and special trolleys which considerably reduce the loss of seed are made to take the sheaves to the mill.

Though fescue is threshed very easily, care is necessary in the setting and speed of the mill, particularly a tin mill with a peg drum, which, if not properly set, chops up the straw. This very short straw is difficult to remove when the seed is dressed. The setting of the mill depends a great deal on the condition of the crop, but usually the concave should not be set too close to the drum, and in tin mills only sufficient concaves should be left in to ensure clean threshing. Speed should be as low as is commensurate with good threshing.

Renovation

The "twitchy" habit of fescue in time causes the area to become "turf bound", and as it will not then produce seed, renovation by skim ploughing is necessary. Good judgment is necessary to decide when a fescue stand should be renovated, and renovation should always be done before there is much ingress of Yorkshire fog and browntop, as the skimming will increase rather than decrease these weeds. This ploughing should not be done until the frost risk has passed, as frost breaks up the furrow and kills the fescue.

If the job has been done skilfully, the fescue comes away between the plough furrows in the following spring. No seed is harvested from a renovated area in the harvest period following renovation.

Weeds and Seed Cleaning

The need for care during threshing is manifest at the dressing plants; if the line has been badly threshed, the small pieces of chopped-up straw are very difficult to remove at dressing and the purity of the line is reduced by excessive inert matter.

The most objectionable weeds in fescue seed are catsear, sweet vernal (*Anthoxanthum odoratum*), and hairgrass (*Vulpia bromoides*). Catsear is the worst of the three, as the seed is the same size and weight as that of fescue and cannot be removed by either riddles or cylinders on the seed-dressing machine. Sweet vernal is removed by placing felts or blankets on one of the riddles, the bent awns of this seed causing it to adhere to the felt. Hairgrass is removed by the cylinders if the awn has not been damaged; if that has happened, it is difficult to remove.

Renovated fescue, showing ingress of sweet vernal, catsear, and browntop.

For export, merchants endeavour to supply seed with a minimum purity of 98 per cent. and a germination of 90 per cent.

Germination

Practically all the seed produced is exported, but the overseas market was affected for many years by the fact that the germination of fescue was subject to deterioration while the seed was in transit. During the First World War cool stowage on cargo ships was not available, and the long period during which fescue seed was sometimes in the hold appeared to aggravate deterioration so that on arrival of the seed large quantities failed to reach the minimum germination standard required by the importer. It was thought that probably the time or the stage of ripeness when the crop was cut, or the usual practice of threshing direct from the stook without giving the seed time to "sweat" in a stack, might be responsible for this loss in vitality.

To study the various factors connected with this loss of germination the Department of Agriculture did extensive investigational work during 1932 and 1933. One of the trials covered 12 commercial lines of seed, six of which were threshed out of the stack and six out of the stook. The seed from these trials was sampled and sent away, part of it being artificially dried and part undried. In addition, part of the seed was shipped in cool store in moisture-proof sacks and part undried and under ordinary hold conditions.

The result of these experiments was that the artificially dried seed in waterproof containers showed very little loss of germination, and as a result the artificial drying of fescue seed and its packing in moisture-proof containers are now the standard method. Serious loss of germination is now most unusual.

Uses of Fescue

Chewings fescue is capable of forming a close, fine, and even turf that will stand hard treatment. It is therefore an excellent grass for recreation areas, bowling greens, golf courses, and race tracks, and has proved admirable for aerodromes, particularly during the Second World War. The area which can be sown with the quantity of seed exported every year is not as large as would appear at first, because the sowing rate for turf establishment is 2/3oz. a square yard, and for reseeding worn turf such as the playing ends of bowling greens ¼oz. a square yard.

Renovation of Deteriorated Lawns

By C. WALKER,
Assistant Fields Superintendent, Department of Agriculture, Palmerston North

IT is not uncommon to find that many lawns after being established under good conditions with adequate seed of suitable species are subsequently allowed to degenerate into run-out swards dominated by flat weeds, clovers, and coarser grasses. However, a run-out lawn can be brought back into first-class condition within a relatively short period by spraying to control weeds and by suitable manuring.

By suitable spraying and manurial treatment a run-out lawn can be brought back into first-class condition in a relatively short period. This illustration shows the correct method of applying fertiliser to a lawn. The material should be cast well up into the air so that it falls evenly in a wide fan, not in a narrow band.

THE degeneration of many lawns can be traced to one or more of the following causes:—

1. Manurial treatment is entirely neglected and semi-starvation sets in. This leads to a weakening of desirable species, with corresponding increases in weeds.

2. Faulty manurial treatment, which encourages coarser grasses and clovers at the expense of the fine turf species. Such treatments include compost, blood and bone, phosphate and lime, and nitrate of soda.

3. Irregular mowing, resulting in some smothering of fine species by excessive growth from time to time.

Any or all of the above can cause fairly rapid deterioration to set in, but equally speedy recovery can be attained by the adoption of proved methods of lawn management. Where a lawn has become infested with unwanted species and appears to lack sufficient fine turf components there is no need to despair; nor is there any need for expensive reseeding, unless bare ground has to be covered.

From research work on deteriorated lawns over the past 3 years the following procedure can be recommended:—

1. Elimination of clovers and weeds: As a preliminary to other work the lawn should be sprayed to eliminate both clovers and flat weeds. Two fluid ounces of the low volatile ester of 2,4,5-T per 100 sq. yds. of lawn and the potassium salt of MCP at 1 fl. oz. to the same area will destroy all existing clovers and weeds. These sprays are best applied in spring or autumn when good growth is taking place. It may be necessary to repeat this spraying 6 months later; if so, half the above quantities would suffice for the second spraying.

If moss is also a problem, it can be destroyed by spraying with sodium pentachlorophenate. This spray is sold commercially under various trade names, and ¾ pint would be required per 100 sq. yds. where the stock solution contains 2lb. sodium salt of PCP per gallon.

2. Manurial treatment: Immediately after spraying, the lawn should receive a dressing of sulphate of ammonia and superphosphate mixed in a ratio of 3 : 1 at 1oz. per square yard. This should be repeated quarterly in the first year, and then at 6 monthly intervals. Under no circumstances should other fertilisers be used in bringing a lawn back, as most of them encourage weed growth or coarser grasses and clovers.

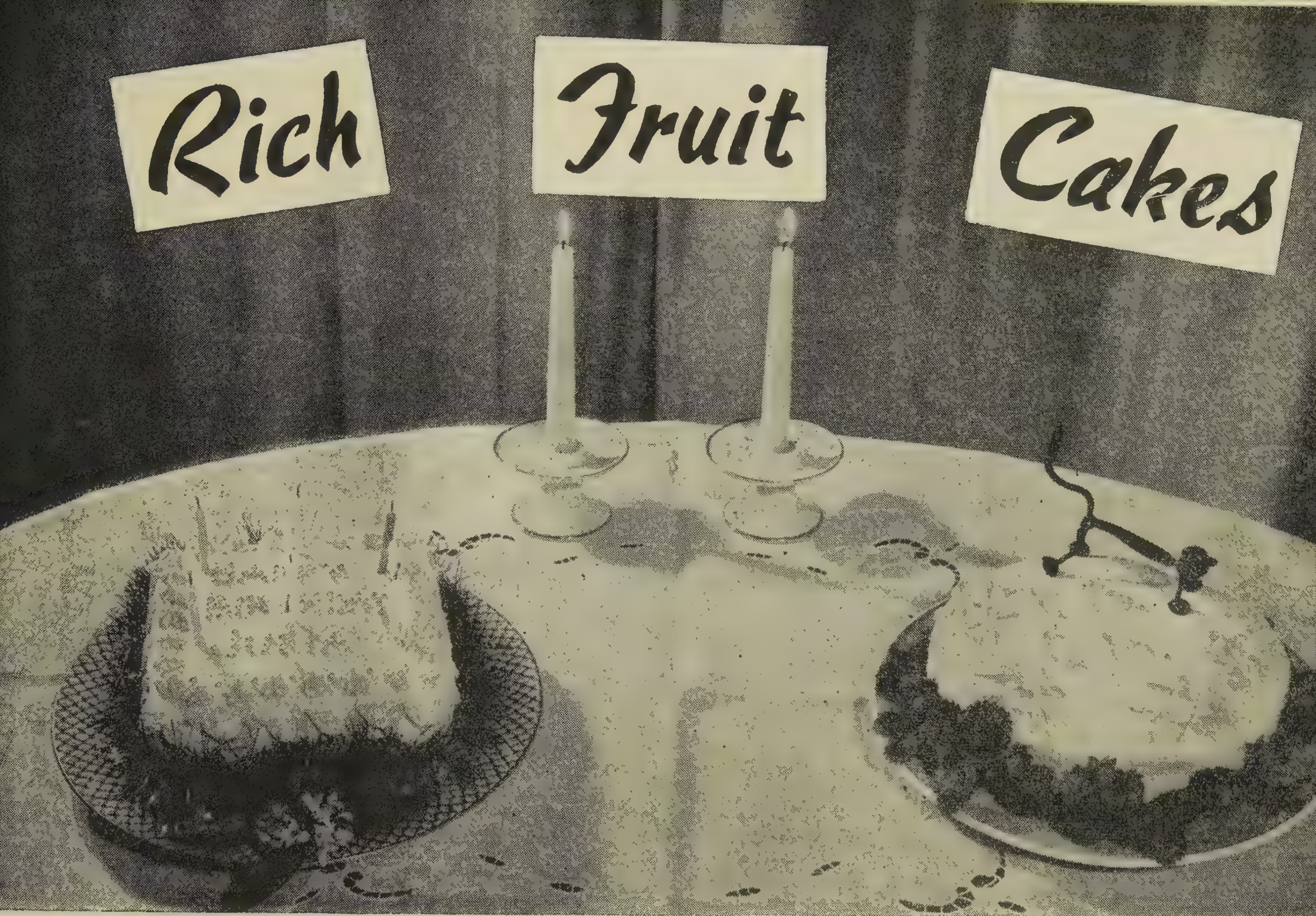
Fertiliser treatment can begin at any time and does not need to follow spraying unless the time is appropriate for spraying.

3. Reseeding: Reseeding should be restricted to bare patches only. Where necessary a mixture of 2 parts of chewings fescue to 1 part of browntop sown at ½oz. per square yard will usually be adequate.

Where there is existing fine turf, even if apparently run-out and very thin, manurial treatment alone will be sufficient to develop a good sward without the addition of any seed. Work done on this aspect of lawn renovation has emphasised the futility of trying to establish seed in an existing sward, even where grooving has been done to aid seed establishment.

Associated with spraying and suitable manuring there should be regular and moderately close mowing to enable fine turf species to get maximum light and to weaken the coarser grasses that thrive under lax cutting. With this procedure a run-out lawn can be brought back into first-class condition within a relatively short period.

Rich Fruit Cakes



By MAUD B. STRAIN,
Field Officer in Rural Sociology, Department of Agriculture, Dunedin

RICH fruit cakes are special-occasion cakes because they take some considerable time to prepare and longer still to bake and are not inexpensive. However, if they are iced and stored properly, they will keep fresh and moist over a long period, as is proved by the old custom of keeping the top tier of a wedding cake to use later as a christening cake. In this article the preparation and baking of rich fruit cakes are described.

A RICH fruit cake is not one of those confections that can be made quickly in a few spare moments. Fruit must be collected and prepared, a cake tin of suitable size must be lined with paper, and the oven will not be available for anything else while the cake is being baked. For these reasons as well as because the ingredients are expensive the making of these cakes is probably one of the least frequent cake-baking activities of the average housewife.

So that the cake can mature and the flavours of the various fruits, nuts, spices, and essences will have time to blend it is advisable to make the cake 3 or 4 weeks before it is to be cut. High-quality ingredients carefully prepared will give the best results and plain flour is superior to special packs. The factors contributing toward a successful product are accurate measuring of ingredients, high quality of ingredients, correct proportions of ingredients, proper method for combining ingredients, and right baking temperature.

Choice of Ingredients

The following points are important in the choice of ingredients:—

Sugar: Fine sugar is preferable to coarse sugar, as it is easier to cream and gives a fine-grained cake. Soft brown sugar is often preferred for fruit cakes.

Fat: Any fat that has a mild flavour may be used, though butter is the first choice because it gives the best flavour. Too little fat produces a dry cake; too much gives a heavy consistency.

Eggs are used to incorporate air and to provide protein which on hardening during cooking encloses the air and makes a raised product. Eggs need not be new laid, but they must be of good quality and fresh enough to beat up well. Good-quality preserved eggs are wholly satisfactory.

Flour should always be sifted. After it has been weighed add the baking powder or soda and the salt and spices and sift the mixture again. Too little flour in a recipe causes the cake to fall in the centre and be heavy; too much gives a dry, compact cake which may rise in a peak and crack on top.

Flavouring essences are added to the creamed fat, as it absorbs flavours readily. Other flavourings such as dried fruits are added later in the mixing process.

Raising agents: Eggs are the main raising agent in rich fruit cakes, little baking powder being necessary. Roughly, a well-beaten egg can lift its own weight in flour.

Preparation of Fruit

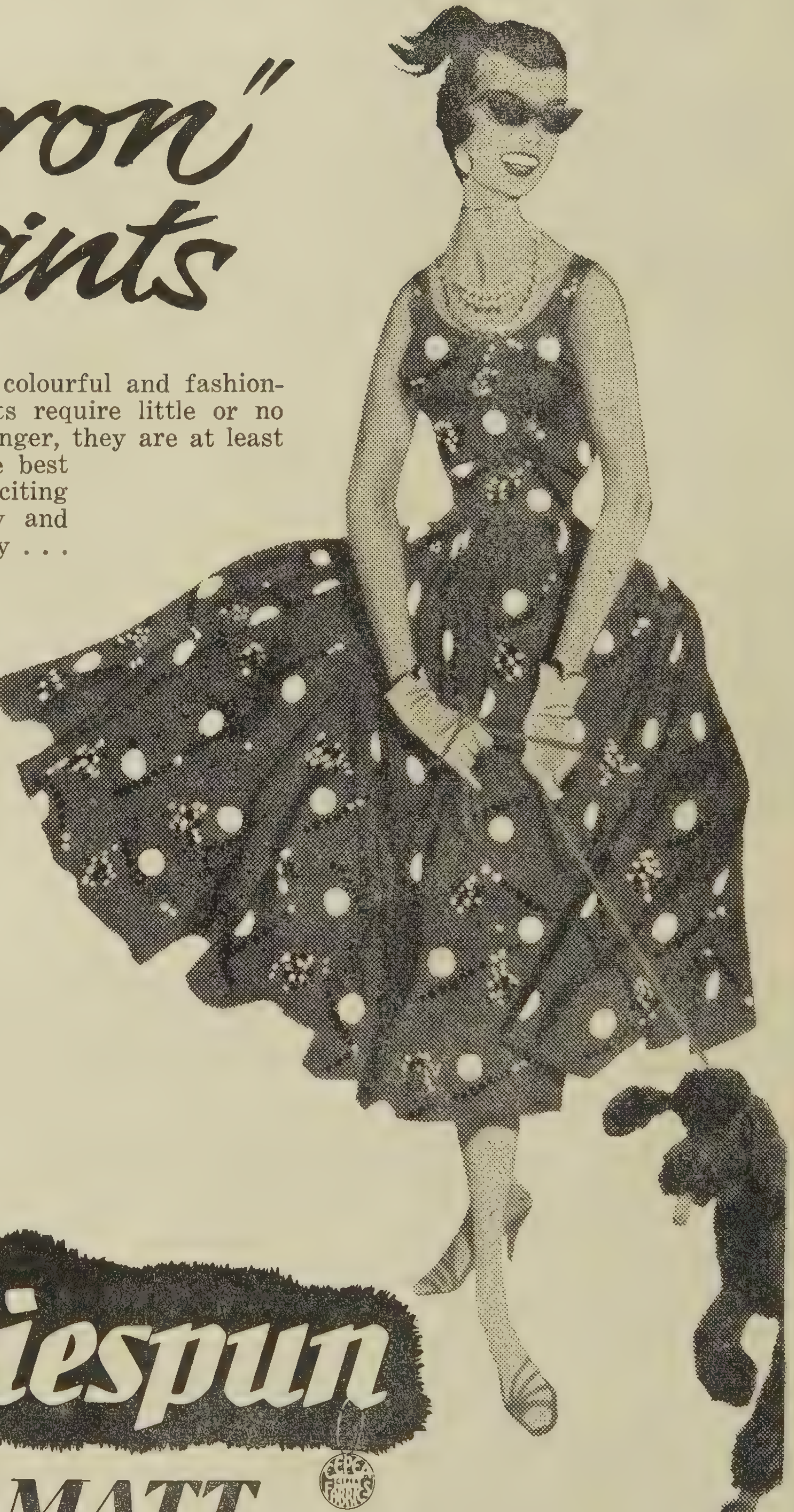
The various fruits should be prepared as follows:—

Currants and sultanas: Wash well, lift on to a cloth, and lightly rub between two folds to dry.

"No-iron" prints

The delightful profusion of colourful and fashion-wise Merriespun Matt Prints require little or no ironing! If dried from a hanger, they are at least equal in performance to the best "no-iron" cottons. This is exciting news for they look so gay and wash and wear so beautifully . . . and they cost so little.

MERRIESPUN ('no-iron') MATT PRINTS with Calpreta Crease-Resist, Shrink-Resist Finish and MERRIESPUN LUSTRE PRINTS with Calpreta Permanent Lustre finish are obtainable in plain colours too. Buy them by the yard or in garments ready-to-wear at your local store today!



CEPEA

Merriespun

MATT

Wholesale Distributors: Sargood, Son & Ewen Ltd., throughout New Zealand.

Almonds: Cover with boiling water, let stand for a few minutes, peel, and chop.

Walnuts: Cut into small pieces.

Candied peel: Remove the sugar from the centre and slice the peel finely.

Dates: Remove the stones and cut the dates into small pieces.

Figs (whole): Wash, dry, and cut in small pieces.

Raisins: Separate and cut in halves.

Cherries (crystallised): Remove the sugar and cut the cherries in halves.

Ginger (crystallised): Remove the loose sugar and slice the ginger finely.

Preparation of Cake Tins

As it is uneconomical to waste good cake mixture by letting it burn during baking, it is best to line the tins. Rich cakes which contain much sugar and fat must be a long time in the oven and are particularly liable to burn.

Paper is cut the same size as the bottom of the tin. Then strips are cut to line the sides, overlapping at the corners and standing 2in. to 2½in. higher than the sides of the tin. The bottom edge of each strip is folded up ½in. and snipped at intervals with scissors. When the paper is placed in position in the tin this snipped edge lies flat on the bottom and turns the corners neatly. After the bottom lining paper is put in place the tin is smoothly lined with the lining standing 1½in. to 2in. above the sides of the tin. For fruit cakes three thicknesses of paper should be used on the bottom. Though it is not necessary to grease the paper when baking a rich cake, a light greasing over the inside surface does help when the mixture is being put into the cake tins.

Brown sugar and golden syrup have been used in the lower cake to make a dark, rich-looking cake. In the light cake on top the even distribution of the fruit is more easily seen. These cakes were not made from recipes in this article.

Several thicknesses of paper on the bottom of the tin will go far toward saving the bottom of the cake from burning. A worthwhile precaution is to place folded brown paper over the top during the first part of the cooking time.

Method of Mixing

Preliminary preparations should be carried out before the mixing is begun. The cake tin or tins should be prepared, the ingredients measured and prepared, and the oven heated to be at the correct temperature when the cake is ready to be baked.

The fat is creamed until soft and then the sugar and flavourings are added. If the fat is too hard to cream easily, the bowl may be warmed slightly by setting it in warm water, but the fat must not be melted. Creaming is continued until the mixture is light and fluffy. To the mixture of creamed fat and sugar the beaten eggs, egg yolks, or whole eggs, depending on the recipe, are added and the mixture thoroughly blended. The flour is added a little at a time, a little being reserved for mixing with the fruit, each addition being mixed in well before the next one is added. The fruit is added last and

LOOKING FOR A WAY TO MAKE A BETTER CUP OF COFFEE—

STOP LOOKING

Buy a Speedee Coffee Percolator. You *must* try percolated coffee, you'll be amazed at the fresher, livelier flavour that only percolated coffee can bring you.

If you still use the old method of boiling, or use coffee essence, it's time you enjoyed the taste thrill of the New Speedee way—the Speedee percolated coffee way. You will never regret the day you too tried Speedee Percolated coffee.

In elegant chromium — Quality Speedee Coffee Percolators make up to six cups of delicious coffee—and are fully guaranteed, of course.

Available from Electrical and Hardware stores everywhere at £6/19/6, or ring your nearest Urlwin Branch.

Speedee Appliances — Faster — Safer — Longer Lasting

H. C. URLWIN Ltd. - Waltham - Christchurch

You value your dogs—your dogs need

BONNY dog biscuits

* As supplied to the dogs accompanying the Ross Sea Expedition.

Working dogs need plenty of nourishment and plenty of pep to do their job properly. And concentrated nourishment is what they get from Bonny Biscuits — red meat, bone, fat and other important food elements. *All* dogs like Bonny Dog Biscuits—and they cost very little.

From all stock and station agents in 56-lb. and 28-lb. bags.

1.6

BONNY

DOG BISCUITS

Manufactured by Bonny Products Ltd., Palmerston North; and distributed by Salmond and Spraggon Ltd. Wellington.

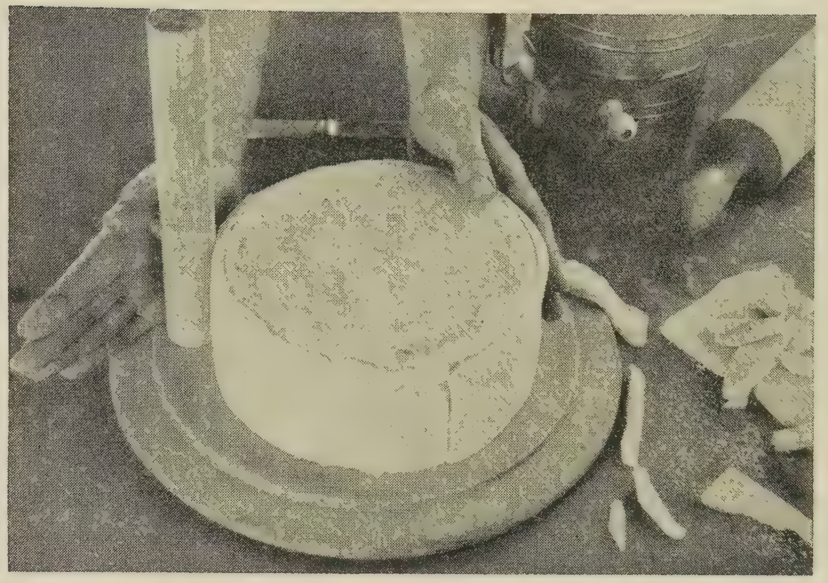
Style-right for the younger set . . .

Academy Patterns

. . . of course!

must be folded in and distributed evenly throughout the mixture.

ICING RICH FRUIT CAKES



[Sparrow

To ensure that the almond paste adheres to the cakes a piece of dowelling is rolled firmly round the sides.

Baking

For baking, the cake tins should be about two-thirds full of the mixture, which should be spread well into the corners and slightly hollowed in the middle so that when the cake has risen it will be flat on top. Rich fruit cakes require a long cooking time in a slow oven. The general rule for cakes is that the richer the mixture is the more slowly it should be baked.

The cake should be placed in the centre of the oven so that heat is distributed evenly round it. If the oven has a tendency to burn cakes on top, it is advisable to place a folded piece of brown paper over the top of the cake for at least the first half of the cooking time. If the oven burns cakes on the bottom, this can be prevented by an extra thickness of lining on the bottom of the tin or by placing for the last quarter of the baking time an asbestos mat on the oven shelf below the one on which the cake stands.

During the first half of the baking time the cake should begin to rise and continue rising until about half-way through the cooking time. At this stage it should begin to brown until at the end of cooking time it should have browned evenly and have settled slightly in the tin. The oven door should not be opened until the cake has been in the oven for 2 to 2½ hours; after that it may be moved carefully in the oven. In an electric oven the top heat should be turned off and the bottom heat turned on low. It is preferable to cook a fruit cake after the oven has been in use for other cooking, because the oven is then well heated through and the temperature will not drop so readily when the cake is first put in.

To test if a cake is done a steel knitting needle or a skewer should be pushed into it from the top; if the needle comes out clean and shining with no mixture clinging to it, the cake is cooked. When a cake is taken from the oven allow it to cool a little before removing it from the tin.

The cake should be wrapped in greaseproof paper and stored in a large biscuit or other tin to mature before it is required.

Common Difficulties

If the oven is too hot during the first part of the baking period, a thick brown crust will form on the outside before the cake has fully risen and before the inside is cooked. As the inside rises and cooks it breaks through this crust, giving a cracked surface with a peak.

A fruit cake batter should be stiffer than a plain one to prevent the fruit settling to the bottom during baking: the cake mixture should only just drop off the spoon, but a too stiff batter will cause a cake to rise unevenly and crack on top.

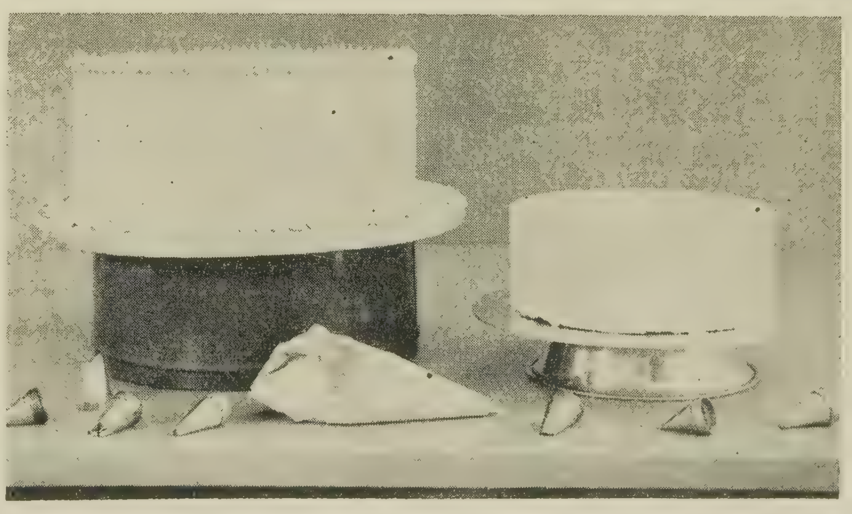
Sinking in the middle could be due to too slow an oven and not sufficient baking, to too high an oven temperature browning the outside of the cake before the inside is cooked, or to the cake being moved about in the oven after it had risen but before it had set.

Dryness could be due to too long cooking, too little fat, or too stiff batter.

Heaviness in texture can be caused by too slow an oven, insufficient baking, too much fat or liquid, or to the fat being oiled before it is creamed.

Icing a Cake

Most special-occasion cakes are iced and decorated. Difficulty sometimes arises through the colour of the almond paste staining the royal icing, or through the colour of the decorating work running into the white icing. To avoid these difficulties it is advisable to do the icing in stages. First, the cake is covered with almond paste. (To make the almond paste stick the surface of the cake is brushed over with a glaze made by mixing a table-



[Sparrow

An icing table is handy, but results can be successful with an upturned cake tin.

spoon of sugar in just sufficient boiling water to dissolve it thoroughly.) About one-third of the almond paste is moulded into a ball free from cracks, rolled out to the exact size required, and placed on top of the cake. It is pressed down lightly all over with a rolling pin to ensure a close fit and any overlapping edges are cut off. The rest of the almond paste is made into one long strip or two shorter strips of a total length equal to the distance all round the sides of the cake and of a width equal to the height of the cake. These strips are pressed on to the sides of the cake and joined exactly so that the whole cake is covered. At this stage it is well to leave the cake for a week wrapped in clean greaseproof paper before applying the icing.

The icing should be put on in two coats, the first coat being allowed to set for a few days before the next coat is put on. After the second coat has been applied a few days should be allowed for the icing to set before the design or writing is attempted. To prevent colours running on the cake the design should be first carried out with white icing and then the coloured piping done on top.

When an iced cake is kept for some time it is often difficult to cut through the icing because it has become very hard. This extreme hardness can be prevented if a small amount of glycerine is added to the icing when it is being made; about a teaspoon of glycerine to 2lb. of icing sugar will be sufficient.

Cake Recipes

Fruit Cake (light)

1lb. of butter
1lb. of sugar
1½lb. of flour
1lb. of seeded raisins
1lb. of sultanas
1lb. of currants
10 eggs
4oz. of crystallised cherries
4oz. of almonds (chopped)
4oz. of preserved ginger
Grated rind and juice of 1 lemon
1 teaspoon of baking powder

Cream the butter and sugar, add the grated lemon rind and juice, and then the eggs two at a time. Beat the eggs in well before adding the next two until all are beaten in. Combine the fruit with the sifted dry ingredients and mix these in with the egg mixture. Place the mixture in a tin lined with three thicknesses of paper and bake in a moderate oven (350 degrees F.) for 5 hours.

This mixture is sufficient for a 10in.-square tin.

Fruit Cake (dark)

1¼lb. of flour
1 teaspoon of baking powder
2 teaspoons of mixed spice
1lb. of butter
1lb. of brown sugar
6 eggs
1½lb. of raisins (chopped)
1lb. of currants
4oz. of sliced lemon peel
4oz. of chopped almonds
Grated rind and juice of 1 orange
1 teaspoon of almond essence
1 teacup of treacle

Cream the butter and sugar and add the orange juice and almond essence. Add the eggs, one at a time, beating each one thoroughly. Combine the fruit with the sifted dry ingredients and mix these in with the egg mixture. Add the treacle and blend it in thoroughly. Place the mixture in a tin lined with three thicknesses of paper and bake in a moderate oven (350 degrees F.) for 4½ hours. This mixture is sufficient for a 9in.-square tin.

Wedding Cake

1lb. of butter
1lb. of sugar
9 eggs
1½lb. of flour
¼ teaspoon of baking soda
1 teaspoon of mixed spice
1 teaspoon of grated nutmeg
½ teaspoon of salt
1lb. of currants
1lb. of seedless raisins
1lb. of seeded raisins
1½lb. of sultanas
10oz. of mixed, sliced peel
½lb of crystallised cherries
½lb. of almonds
1 teaspoon of vanilla essence
1 teaspoon of lemon essence
1 teaspoon of rum essence
1 teaspoon of almond essence

Cream the butter and sugar and add the essences. Add the eggs one at a time, beating each egg in thoroughly. Sift the flour, spices, and other dry ingredients together three times. Chop the almonds and cherries and mix all the fruit well together. Mix the flour mixture and the fruit mixture alternately, 1 tablespoon at a time, into the butter mixture.

Put the mixture into prepared tins and hollow it slightly in the centre so that the cake will be level when baked. Bake in a moderate oven (350 degrees F.) for 4 to 5 hours. In an electric oven turn the top heat off and leave the bottom heat on low.

This mixture makes a large cake or a medium cake and a small cake. Two mixtures make a three-tier cake.

Christmas Cake

1lb. of butter
1lb. of caster sugar
8 eggs
1lb. of flour
1 teaspoon of baking powder
1 teaspoon of ground cinnamon
1 teaspoon of ground cloves
1 teaspoon of ground ginger
1 teaspoon of ground mace
1 teaspoon of ground allspice
½ teaspoon of salt
½lb. of sultanas
1½lb. of currants
¼lb. of glace cherries
¼lb. of chopped angelica
¼lb. of sliced citron peel
2oz. of sliced lemon peel
2oz. of sliced orange peel
4oz. of chopped almonds
4 tablespoons of brandy or sherry

Sift the flour, spices, and salt. Cream the butter and sugar. Sprinkle each egg lightly with flour and beat it into the creamed mixture. Mix the remainder of the flour with the fruit and stir these into the creamed mixture. Add the brandy or sherry and mix it in well. Place the mixture in a tin lined with three layers of paper. Bake in a slow oven (300 degrees F.) for 5 to 5½ hours.

Fruit Cake

7oz. of butter
7oz. of brown sugar
10oz. of flour
1 teaspoon of baking powder
¼ teaspoon of salt
4 eggs
12oz. of sultanas
Grated rind and juice of 1 lemon
8oz. of currants
2oz. of glace cherries (chopped)
2oz. of almonds
2oz. of mixed peel (sliced finely)

Cream the butter and sugar. Beat the eggs. Sift the dry ingredients together. Add the beaten egg and flour mixture alternately, and then the grated rind and juice of the lemon. Mix in the prepared fruit and place the mixture in a tin lined with paper. Bake in a moderate oven (350 degrees F.) for 3 to 3½ hours.

Easy Fruit Cake

8oz. of flour
4oz. of butter
8oz. of brown sugar
1 egg
1 cup of moist fruit mincemeat
½ cup of milk
¼ teaspoon of salt
¼ teaspoon of cinnamon
¼ teaspoon of ground cloves
3 teaspoons of baking powder
¼ cup of chopped nuts
½ cup of chopped candied fruit

Cream the fat until soft. Add the sugar gradually and cream with the fat until light and fluffy. Add the well-beaten egg and then the mincemeat. Sift the flour with the salt, cinnamon, ground cloves, and baking powder. Add the milk alternately with the sifted dry ingredients to the sugar mixture, combining them with a beating motion. Fold in the fruit and nuts. Bake in a prepared cake tin in a moderate oven (350 degrees F.) for 1¾ to 2 hours.

Icing Recipes

Directions for icing and decorating a cake were given in the November 1953 issue of the "Journal".

Almond Paste

1lb. of icing sugar
2 eggs
1lb. of ground almonds

Sieve the icing sugar, add the ground almonds, and mix together. Make a well in the centre, stir in the beaten eggs, and mix to a stiff paste. Dredge a board lightly with icing sugar, turn the paste on to it, and knead until it is smooth and pliable.

Royal Icing

2lb. of icing sugar
3 egg whites
Juice of 1 lemon
1 teaspoon of glycerine

Sieve the icing sugar. Add the whipped egg whites and the lemon juice and then the glycerine gradually. Work the mixture with a wooden spoon until it is of a thick creamy consistency, stiff enough to stand up in peaks.

Mock Almond Icing

¼lb. of butter
¼lb. of flour
1lb. of icing sugar
2 egg yolks
1 tablespoon of almond essence

Cream the butter and icing sugar together, add the egg yolks and then the essence, and lastly the sifted flour. Knead the mixture well.

A variety of foliage plants suitable for indoor decoration.

Decorative Plants in the Home

THE modern types of house plants which have become so popular overseas are becoming more readily available in New Zealand and are creating much interest. In this article K. H. Marcussen, Horticulturist, Department of Agriculture, Christchurch, discusses their general requirements and care. The various types of plants are also described. The section on garden work for October is by Rosalie A. Campion, Horticultural Instructor, Department of Agriculture, Wellington.

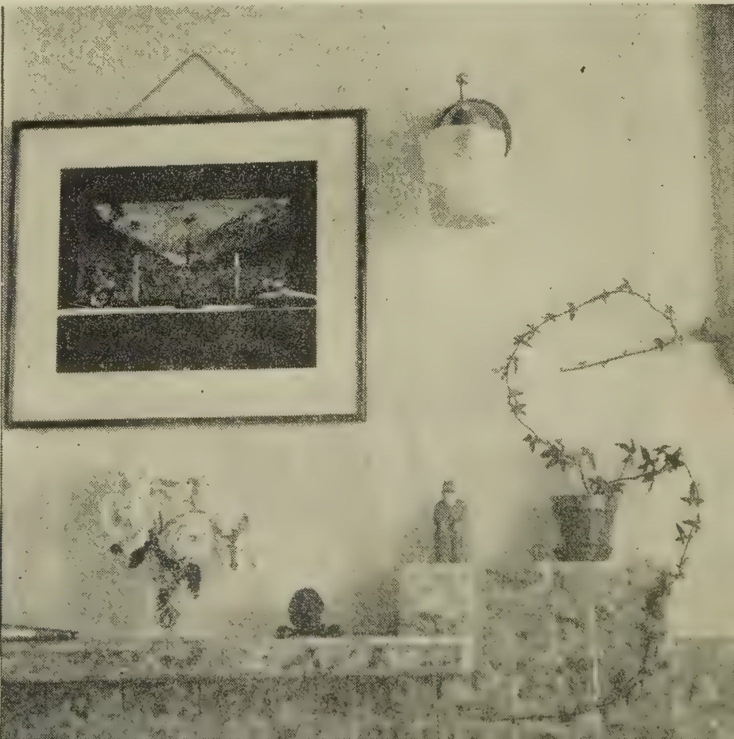
INTEREST in house plants in New Zealand has never been comparable to that in some overseas countries. The way of living and climate have probably much to do with it, as most New Zealanders live in houses surrounded by gardens; even many flat dwellers have a garden plot for their use, and in general most New Zealanders are good gardeners. Furthermore, the climate is such that almost everywhere in the country it is possible to obtain some material for making up indoor decorations throughout the year.

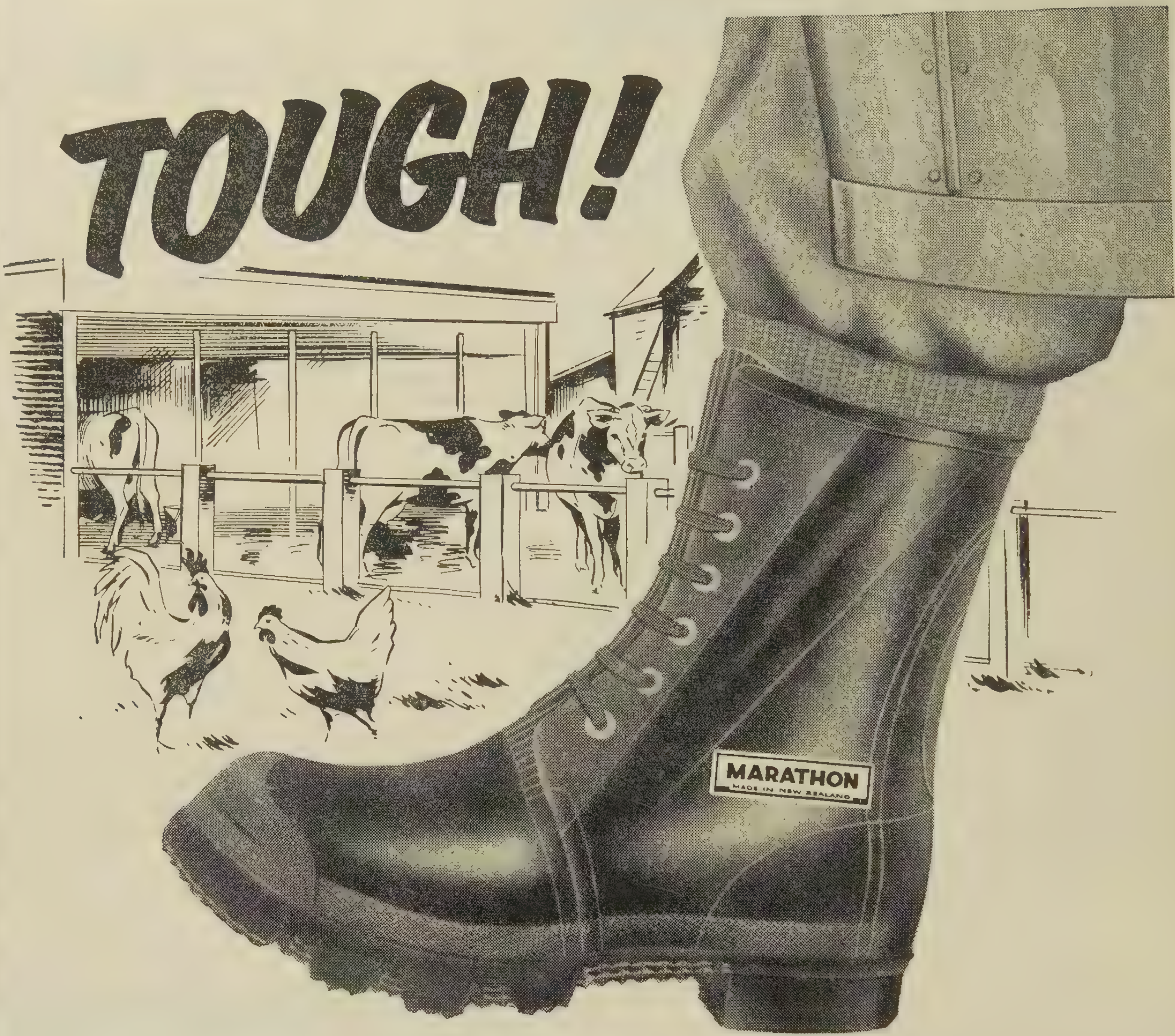
In many overseas countries conditions are very different. Large blocks of flats are common in the bigger cities and though the tendency now is to have gardens round such buildings wherever it is possible, these are communal and do not provide material for cutting.

Cut flowers are bought to a much greater extent than here, but in addition pot plants are now relied on to brighten the homes.

Flowering plants are used in season, but foliage plants are perhaps more popular. The various-shaped leaves and

▼ Maidenhair fern (left) and ivy (right).





The ASHLEY ANKLE BOOT

Over Ten Million pairs of rubber footwear have already been manufactured by Marathon.

Tough . . . that's the Ashley. A boot built for hard work . . . built for comfort and protection whatever the conditions. Farmers and outdoormen throughout the country rely on Ashley by Marathon. You can rely on them too !

Marathon
BY SKELLERUP

the many colourings which can be obtained make certain types suitable for any particular position, and for modern homes they are excellent.

No longer are they placed in a row on the windowsill, but in groups in the window, on special tables, or in stands, and large specimens are placed on the floor to put life into a corner or a wall.

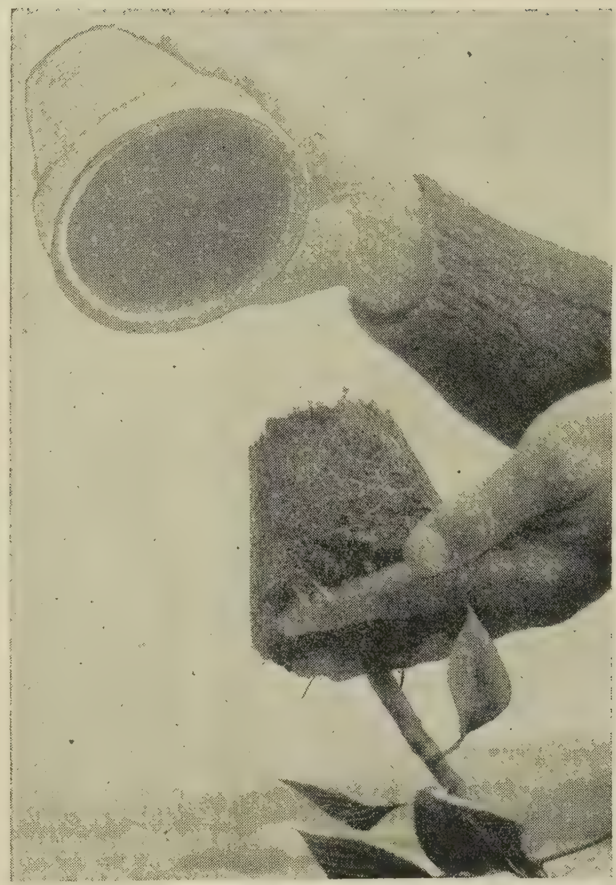
General Requirements

When a nurseryman grows plants in a glasshouse he attempts to provide the most suitable conditions for their growth, and regulates the temperature, light intensity, and humidity according to their particular requirements.

The same care should be given to indoor plants, and in general the plants which are chosen will tolerate the conditions met with.

Light

If pot plants are kept near windows during the warmer seasons, the sun shining through the glass is liable to burn the foliage, especially where any drops of moisture are present. Few plants require full sunlight and most prefer the sun's rays to be broken, as is done by curtain net.



To turn a plant out of its pot put the fingers on the surface → of the soil on either side of the stem, invert the pot, give it a sharp tap, and the pot can be lifted away freely.

Most foliage plants will grow satisfactorily without sun provided the light is good; it will often be found that they turn their leaves toward the windows, a fact that can be taken advantage of if they are placed near a wall away from a window.

Others, especially ferns and climbers such as ivy, will tolerate darker positions.

Temperature

Temperature should be as even as possible; preferably slightly lower during darkness, and great variations should be avoided. Central heating is, of course, the ideal. No plants will be happy in a room which is kept just warm during the day, provided with a roasting fire during the evening, and gradually cooled off during the night. A cooler room heated only by the sun would be much more suitable.

Atmosphere

A stuffy atmosphere suits neither humans nor plants, and adequate ventilation should be provided for change of air. Draughts, however, should be avoided.

Humidity, which plants prefer at a relatively high level, is a problem. A humid atmosphere is not desired in any room, and all that can be aimed at is to create a suitable micro-climate or localised condition round the plants.

One of the best ways to do this is to have a deep tray made for the plants. Galvanised iron is suitable and can be painted or cased in wood to fit the surroundings. When plants are placed in the tray the spaces between them should be filled up with fine shingle. Not only will the plants require less watering when plunged in this manner and look more attractive because the pots do not show, but if the shingle is kept moist some water will evaporate when the air is warm and thereby raise the humidity round the plants.

Gas can be a problem; plants have often died as a result of leaking taps or joints.

Arrangements and Containers

It has been mentioned that plants often look better if grouped together and in a previous paragraph it has been suggested that they should be placed in a shingle-filled tray. There are, however, positions where a single plant is preferable. Larger plants, especially, are attractive on their own. Climbing plants look well on the plain walls which are popular and can be placed either in wall pots, suspended on a bracket, or on a small shelf.

It is sometimes necessary to provide support for plants grown in pots. For climbers it is very tempting to use a strip of transparent adhesive tape, but either this soon comes off or it may be so effective that the paint or wall paper comes off with it. Suitable stakes should be used: split bamboo and plastic or plastic-covered knitting needles are suitable. The latter are available in many colours, and if they are chosen to match the background, they will be inconspicuous.

Plastic pots are becoming more popular than the once universally used clay pots. They are easily kept clean and they do not draw moisture from the plant. The latter may not be an advantage as will be understood from the comments on humidity. More overwatering is done where plastic pots are used than with clay pots. Whichever pots are used they should be provided with a drainage hole for best results.

Hanging baskets are best used outside. They have a tendency to drip, which is not satisfactory above covered or polished floors.

Watering

It is frequently asked: how often should a pot plant be watered? No definite advice can be given, as it depends on the requirements of specific plants under varied circumstances. It is necessary to get to know the plants and judge their need according to the temperature, humidity, and stage of growth. It is, however, safer to water a little less than required than too much, particularly in winter or when a plant is not growing vigorously.

When watering, it should be done generously, so that the soil becomes moistened right through, after which the plant should be left until water is required again. If a plant has become really dry, it is best to soak the whole pot in a bucket or tub of water. That method is the only thorough one for a hanging basket.

In general, it is not advisable to leave water in the saucers. Only the lower part of the pots draws the moisture and this portion will in fact be permanently saturated, the result being that the soil becomes sour.

Feeding

Plants cannot live on water alone and even if plant food has been supplied in the soil, it will become depleted after a while, both through usage and by the leaching caused when watering. Nitrogen will probably be the element in shortest supply, but it is generally best to supply a mixture.

← The aluminium plant (*Pilea cadierei*).

The foliar fertilisers now available are very convenient to use on pot plants. They can be sprayed on to the leaves for quick response or can be watered in and will then be absorbed by the roots. These materials provide the easiest method of feeding pot plants and they have been found very effective for this purpose.

Feeding should be done judiciously. It is seldom required during the first 2 months after potting, but later can be done every week or two while growth is vigorous. During winter it should be done less frequently, except where plants are growing under optimum conditions in a well-heated room with an even temperature.

← *Ficus elastica variegata.*

Potting New Plants

The John Innes potting compost is the most suitable to use when new plants are being potted. With only a few plants, it is probably best to purchase some ready mixed, as it is not easy for the home gardener to obtain the right ingredients and attend to sterilisation. The John Innes potting compost consists of the following:—

7 parts (by volume) of loam
3 parts (by volume) of peat or leaf-mould
2 parts (by volume) of coarse sand

← *Dieffenbachia sequine.*

For each bushel add 1½oz. of dried blood, 1½oz. of superphosphate, ¾oz. of sulphate of potash, and ¾oz. of lime

Sterilisation is dealt with fully in Department of Agriculture Bulletin No. 363, "Disinfection of Nursery Soil", which is available free from the nearest office of the Department of Agriculture.

To facilitate uniform packing in the pot the compost should have the correct moisture content when used. A simple test is to squeeze a handful; it should keep its shape but be broken up easily when touched.

The size of the pot to be used must be governed by the size and type of the plant, but it is seldom advisable to use a pot larger than necessary. It is better to use a smaller pot and "pot on" to a larger size as the plant grows. When that is done the whole clump of soil becomes filled with roots, not just the outside as might be the case otherwise.

Adequate drainage should be provided in the bottom of the pots. For a small pot a single crock covering the hole is enough, but for a large one a layer of crocks or small rough stones should also be provided.

In the operation of potting some compost should be placed in the bottom of the pot before the plant is put in; compost should then be filled in round it. After it is packed with fingers and thumbs the pot should be lifted by the rim by both hands and given a sharp tap or two on the bench to settle the soil, particularly in the bottom.

Potting on

Young, vigorously growing plants may require to be potted on to a larger size during summer, but older plants are more commonly potted on in late spring.

For this the John Innes compost should also be used, but instead of adding the fertilisers as listed, the quantities should be doubled; for very strong-growing plants they can be trebled.

On the development of the roots must rest the decision whether potting on to a larger size is required or repotting into the same size will suffice. The pot should be removed, as shown in the illustration on page 309, and the roots examined.

If the roots form a tight ball, potting on to a larger pot is generally required; and it is first a matter of trying to remove some of the old soil by squeezing the clump lightly. Potting on is done like potting up, but for the packing of the soil a rammer is necessary. Any piece of wood of the appropriate thickness will do; it should be possible to get it between the pot and the roots without damaging them.

Repotting

If it has been found that a clump when removed from the pot is not full of roots, then the plant should not be potted on to a larger pot. Instead, some of the soil should be removed carefully so that the roots are not damaged and it should be repotted in the same-sized pot, or if the root system is poor, it may even be preferable to use a smaller size. Some root pruning may then be beneficial; a few long roots are of little benefit to a plant; it is generally better to trim them back, which may result in several new ones forming.

When the roots are poor it will often be advisable to reduce the size of the plant by pruning. A balance will then be obtained between top and roots, the plant being given a greater chance for proper development.

Pruning can also be done with many plants if they are growing too large for their position. They can be repotted and the roots pruned as well as the top; this is one of the methods used in growing the dwarf trees so popular with the Japanese.

Preparing Hanging Baskets

Hanging baskets are most satisfactory if they are prepared with firm pieces of moss of the type found in semi-shaded bush. This kind is better than sphagnum moss, which disintegrates after a while. The moss should be placed with the green side out. Moss of a good thickness is preferable, but if it appears too thin in places, a double lining can be used. It is, of course, easier to use large pieces of moss, but it can be joined quite satisfactorily provided an overlap is made.

The top edge should come well over and be doubled back into the basket, where it will be held firm by the compost. Such a rolled edge will not only make watering easier, but will give the basket more finish.

Baskets should be planted up in the same manner and with the same compost as detailed for pots.

General Care

For the first few weeks after potting special care should be given. The soil should not be allowed to dry out, but overwatering must be avoided as it is detrimental to development of new roots. On warm days syringing of the foliage will be beneficial; draughts should definitely be avoided.

Pot plants should be kept clean at all times by the removal of dead and dying leaves and flowers, not just because they look unsightly but because they may provide a home for disease organisms. Diseases will then generally cause little trouble, because the plants are grown isolated from others.

Insect pests may, however, be introduced. Common ones are sucking insects, such as aphids, and sometimes scales and mites; caterpillars can also cause trouble. Caterpillars can usually be kept in check by hand picking and for the others the usual certified insecticides are effective. Malathion has been found effective on most of these pests, but it cannot be recommended as safe on succulents and orchids.

For development of bushy plants it is sometimes necessary to pinch the growing points out of the stronger shoots. This can be done at an early stage, but if it is desired to grow additional plants, such shoots can often provide material for cuttings.

Propagation was dealt with in an article in the December 1956 issue of the "Journal".

The topsoil should be stirred up occasionally for aeration and to prevent slime and moss forming; this can be done with a small stick or the point of a knife. It also gives the plants a well-kept look.

Sansevieria. →

Types of Plants

A much greater selection of plants is available now compared to that in the era of the aspidistra, geranium, and palm. These plants are still used, but they are not predominant as they were earlier, and now they are used in association with other plants. There is a great range available already and more are being introduced by nurserymen specialising in these plants. Some of those which are readily available are discussed in their various groups.

Flowering Plants

Flowering plants are generally the most colourful subjects; they are, however, mainly seasonal and showy for a limited period only.

The many well-known subjects in this group include begonia, bougainvillea, bulbs of many kinds, calceolaria, cyclamen, fuchsia, gloxinia, heliotrope, hibiscus, hydrangea, isoloma, pelargonium, and streptocarpus.

The **shrimp** or **lobster plant** (*Beloperone guttata*) has become very popular. In the north it is hardy and can be grown as a small shrub outside, but it is equally suitable for growing in pots indoors. The common name has been given it because the inflorescence resembles a shrimp or small lobster.

The **balsams** (*Impatiens holsti*) have always been popular, but a new dwarf type which has recently come on the market overseas should be an improvement for growing in pots. It can be raised easily from seed and some interesting colours may be obtained. It is listed in English seed catalogues.

Saintpaulia or **African violet** is available in many varieties. It is charming as a small plant and if grown under suitable conditions will produce masses of small flowers. Too often, however, in unsatisfactory environments the plants are disappointing. They detest changes of conditions. Temperature should be steady at a moderate level not much below 50 degrees F.; they should not be allowed to dry out, but overwatering can be equally detrimental. Humidity should be regulated according to the temperature; when the plants are growing under high temperatures the atmosphere should never be dry. They require moderate light, but not direct sunlight.

A great number can be used and delightful arrangements can also be made by flowering various bedding plants out of season: cinerarias, schizanthus, primulas, large-flowered petunias, french marigolds, celosias, nemesias, and dwarf salvias are examples, but many others can be grown successfully.

Ferns

Though these can be classified as foliage plants, they are considered separately, because their requirements vary from those of most other plants.

Peperomia sandersi.

Pseudopanax lessoni.

Ferns are mainly found as undergrowth in the bush, a fact which will give an indication of the conditions they prefer. They will tolerate darker-growing conditions than most other plants, and when temperatures are high they require frequent waterings; they prefer a humid atmosphere.

There are many true ferns available. "Asparagus ferns" (*Asparagus sprengeri*, *A. plumosus*, and *A. asparagoides* (smilax)) are not true ferns, but are closely related to the culinary asparagus; they are much hardier and will tolerate drier conditions and direct sunlight.

Foliage Plants

Foliage plants are a group of house plants which are creating much interest not only in New Zealand but overseas. Some of these plants do flower, an additional attraction, but in the main they are grown for foliage. Not only is the foliage varied in size and shape, but the range in variegation and colour is large. There are many shades of green together with grey and silver tonings, yellow, and gold, and a range of pinks, reds, and purple. Each one may be delightful on its own, but its full beauty is seen when it is associated and the contrasts featured. The following are among the best known in this group:—

Aralia sieboldi (now named *Fatsia japonica*) is an old favourite. The large, green leaves give contrast to other plants. It is hardy.

The **begonias** form a group of their own. Most of them have attractive flowers as well as coloured foliage. They range in size from quite small plants to the shrubby types growing several feet high.

The **billbergias** are quaint plants. The coarse leaves form a tube from which the flower stems emerge. The flowers are very showy. Billbergias require little water during winter. There are several varieties available.

Calatheas are tropical plants and should be given a warm situation. Different kinds available all feature the tall-growing leaves with different markings.

The **camphor tree** (*Cinnamomum camphora*) makes a lovely small tree in a pot. It develops a stem and has pale green, aromatic foliage.

Coleus are well known for their bright foliage. They are easily raised from seed, after which the best types can be perpetuated by cuttings.

The **crotons** (*Codiaeum* sp.) are among the most colourful foliage plants. They are tropical shrubs and demand a warm situation.

Dieffenbachia is another tropical plant. There are different species available with large, irregularly variegated foliage.

A number of **dracaenas** are available. They have sword-like leaves and are somewhat similar to the New Zealand cabbage tree, though smaller in habit and more graceful; some are vividly coloured.

Euonymus japonica, the evergreen spindleberry, makes a good house plant. It is available in several types with white and golden variations.

A number of *Ficus* sp. make good specimen plants. *F. macrophylla* and *F. elastica* (the rubber tree) are the best known; of the latter a golden, variegated form is much prized overseas and will probably soon be available here.

Fittonias are grown for their heavily veined leaves.

Grevillea robusta, the Australian silky oak, features finely cut leaves in pale green. It forms a definite stem, but the leaves stay on well.

Iresine is a soft-stemmed plant sometimes used in bedding displays. It is available with various coloured foliage in blood red, crimson, carmine, golden, and green. Frequent stopping of the growing points is required to produce a bushy plant.

Maranta leuconeura is a dwarf plant grown for its curiously marked leaves. It will not tolerate cold winters.

The **mountain pawpaw** (*Carica candamarcensis*), which is grown outdoors in warmer parts of the country, makes a good house plant somewhat resembling aralia but with a thicker stem. It is easy to raise from seed and is quick growing.

Nile grass (*Cyperus* sp.) has palm-like foliage but a bushy habit. It is very decorative and useful among other plants. As it is a member of the sedge family, it responds to a plentiful supply of water.

Peperomia sandersi is the best known of this genus, but others are available. They are all of compact habit and have fleshy, marked leaves. They require warmth.

Pileas are soft-stemmed plants. The artillery plant has fern-like foliage and is named from the manner in which the pollen sacks explode. The aluminium plant has green leaves with aluminium-coloured marking.

Pineapples make interesting plants for the home. The shoot on a fresh pineapple can be grown as a cutting and the plant may flower; in some instances under good conditions fruit has developed in about 3 years.

Sansevieria is grown for its stiff, erect, strap-like leaves. The usual type has silver marking on the green leaves; the golden form is superior but in short supply.

Variegated forms of abutilon and fuchsias can also be included in this group, as their foliage is usually more effective than their flowers.

Native Plants

There are many native plants which, because of their beautiful foliage, are very suitable as house plants. A few are suggested, but many more can be used.

Akeake (*Dodonaea viscosa*) is available in both green and purple forms. It is light in structure with narrow leaves.

The **cabbage tree** (*Cordyline* sp.) is available in several species, one with bronze leaves.

The variegated form of **taupata** (*Coprosma baueri variegata*) is slightly pendulous and a very useful subject.

There are several "five-fingers" belonging to the genus *Nothopanax* and the five-fingered lancewood *Pseudopanax lessoni*; the leaves of the latter are more finely cut and of a darker green colour than the former.

The variegated varieties of **flax** (*Phormium tenax*) are smaller than the common one and make excellent pot plants.

The prostrate **fuchsia** (*Fuchsia procumbens*) has very fine foliage, but the unique flowers and large, reddish fruits are a special attraction.

The **lancewoods** (*Pseudopanax* sp.) in the juvenile form make some of the finest plants for a contemporary home. The species vary in colour.

Parapara (*Pisonia brunoniana*), and especially the variegated form, is known for its large, decorative leaves.

Various *Pittosporum* species are suitable both in their green and variegated forms.

The **puka** (*Meryta sinclairi*) is useful both as a small and larger plant and grows well indoors. The thick-textured, large, green leaves are its most attractive feature.

Lancewood (*Pseudopanax crassifolium*).

Puriri (*Vitex lucens*), which has dark green, glossy leaves, can be flowered in pots. It develops quite a spreading habit which is unusual for trees grown in containers.

Ramarama or **New Zealand myrtle** (*Myrtus bullata*) has reddish-brown, crinkled leaves which are very attractive.

The **red beech** (*Nothofagus fusca*) is valued for its fine foliage.

The **rimu** (*Dacrydium cupressinum*), with its drooping branches and especially in its juvenile form, is one of the most graceful house plants.

Titoki (*Alectryon excelsum*) has distinctive, dark green foliage.

Climbers

For use as specimen plants the climbers are perhaps the most decorative. A great range is available. Among some of those mentioned great variation is found within the species.

The largest group is the **philodendrons.** The most vigorous is *Monstera deliciosa*, with large, deeply cut, dark green leaves. It has aerial roots, which are an added attraction. It is not a true philodendron, but is sometimes named as such in overseas literature.

The true *Philodendron* is a large genus of climbers with dark green leaves in many shapes, both deeply cut and with entire edges. They are tropical plants and will not tolerate cold conditions.

The variegated philodendrons belong to the genus *Scindapsus*, but are much like true philodendrons in habit and requirements.

Next in diversity is **ivy** (*Hedera* sp.). There are various variegated forms, but also species with different types of green leaves. They are among the most hardy plants and will tolerate fairly dark positions.

Some **Virginia creepers** can also be used as house plants, but they lose their leaves at the end of summer. They compensate, however, by their glorious autumn colour and the fresh green shoots in spring.

Closely related to the Virginia creepers are the *Cissus*, of which several species are available. They are vigorous-growing climbers with very decorative leaves.

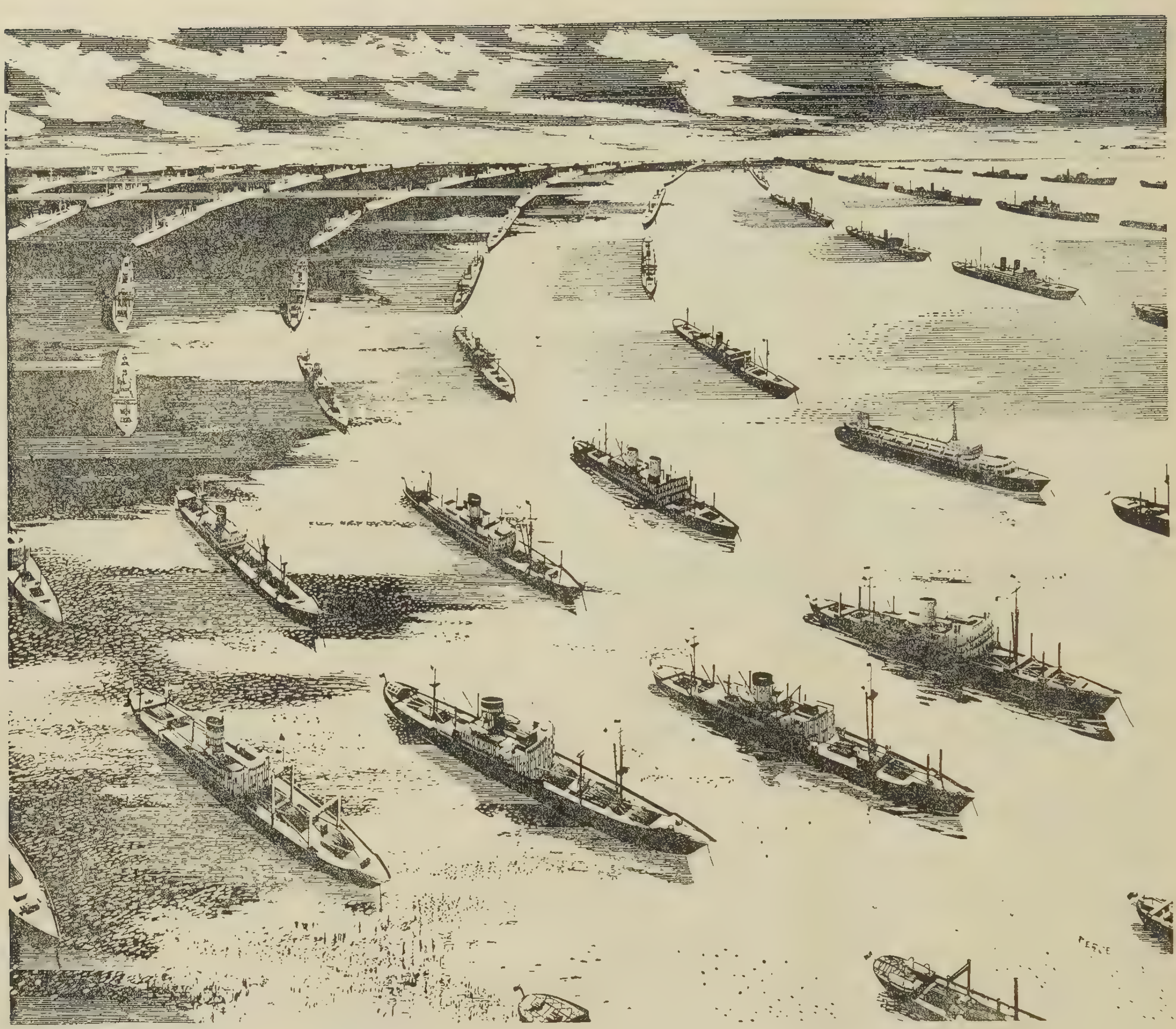
The **climbing fig** (*Ficus pumila minima*) is very dainty, with small, green leaves.

The **"Wandering Jew"** (*Tradescantia fluminensis*) is well known in its white or golden, variegated forms. The one with silvery variegation and purple reverse is *Zebrina pendula*.

Polygonum capitatum is rather similar in habit, but not so fragile in the stems. It has a curious V marking on the leaves, which turn reddish if the plant is grown in the sun.

The **wax plant** (*Hoya carnosa*) is well known. To get the best view of

Succulents are useful for permanent decorations of bowls.



The sight that no one will ever see

If the ships of the New Zealand Overseas Shipping Lines used on the homeward run in 1956 could take time off and gather together, this is the picture they would present. . . .You would see, lying at anchor, no less than 91 ships which were required during the year to provide the 146 sailings from this country (this does not include any additional sailings by vessels chartered from other Lines). In size, the ships range from the "Dominion Monarch" of 26,463 tons to the "Napier Star" of 7,165 tons. Their carrying capacity, all told, is 415,213 tons of refrigerated cargo, 205,394 tons of wool and general cargo, plus accommodation for some 5,000 passengers. They represent a capital investment of about £90,000,000, but to replace them at today's prices would cost roughly £200,000,000. So great a fleet would make a fine show, but no one will ever see it. For these ships are on active service, carrying the trade upon which we all depend. During 1956, they linked ten New Zealand ports with 34 ports in the British Isles, the continent of Europe, the Mediterranean, the eastern seaboard of North America, the West Indies and other parts of the world. And so, on every day of the year, the ships we picture here are scattered in the ports and across the seas of the world, going steadily about their business . . .

. . . which is, of course, your business, too.

Issued in the interests of mutual understanding by

NEW ZEALAND OVERSEAS SHIPPING LINES

SHAW SAVILL & ALBION CO. LTD · THE NEW ZEALAND SHIPPING CO. LTD · PORT LINE LIMITED · BLUE STAR LINE LIMITED the flowers it should be trained so that each inflorescence is exposed. The flowers should never be picked, as on this plant a new inflorescence will form each year on the old flower stems.

There are various **passion flowers** (*Passiflora* sp.) which are not too rampant for indoor growing.

Saxifraga sarmentosa, better known as "Mother of Thousands" or "Aaron's Beard", is an attractive trailing plant. The leaves are silvery marked with purple reverse. The offsets are suspended on very thin runners.

Similar in nature is the **rosary vine** (*Ceropegia woodi*), but it is not so rampant, forming single runners on which the fleshy, grey leaves and curious flowers form.

Cobaea scandens can be grown as an annual vine inside. It is very vigorous and can be trained to frame a window in one season.

Succulents and Cacti

Succulents and cacti are ideal for growing indoors and enthusiasts do not object to the thorns. Many are, however, quite safe to handle and they are ideal because they require little attention. Some are useful for growing together in bowls, where they will look attractive for a long time.

Garden Work for October

As the days lengthen and the soil becomes warmer weed seeds begin to germinate, and it is at this early stage that they are most easily destroyed. Where beds have been planted symmetrically the regular, shallow use of the push hoe gives excellent results. It is desirable, however, to remove the young plants which the hoe chops off, as there is generally sufficient moisture at this season to allow the plants to re-root and grow a seed head. In mixed borders the use of a hoe is often hazardous and the young growing tips of plants are easily removed by mistake. A light hand fork can be used carefully among the plants and the weeds removed from the loose soil. As there will not yet be any seed-head formation, the weeds can be placed in the compost bin.

Seed Sowing Outdoors

Sowing of seed of a wide variety of annuals should be continued. Though it is necessary to use mainly those plants which have been proved to do well in the district, seeds of a wide variety of the less known annuals are worth a trial. These include alonsoa, cynoglossum, limnanthes, ursinia, and phacelia, which should be sown where they are to flower; calandrinia, gilia, kochia, littonia, and venidium, which are half-hardy plants requiring a little extra warmth and which preferably should be sown in boxes; browallia, a bedding plant for a sunny position in rich, free loam; and nierembergia and matricaria, which are dwarf edging plants for growing under good, average conditions.

Plants which are attractive and useful both in the garden and in the home such as the ornamental kales, beets, gourds, sweet corns, and the castor-oil plant (*Ricinus communis*) can be grown easily from seeds sown as the ground becomes warmer and more easily worked. If seed of the dainty everlasting flowers acroclinium, rhodanthe, and helichrysum is sown now, they will make welcome additions to the material available for winter decorations. This is a very desirable aspect of gardening where winter flowers are somewhat limited, and those plants which can be attractive during the growing season as well as preserved are worth a place in most gardens.

GARDEN WORK FOR OCTOBER

Campbell

Dahlias which have remained in the ground for the winter and those which were started into growth in boxes last month should be divided as soon as danger of late frost is past.

Preparing Beds for Planting

The spring bedding plants will by now be deteriorating, and healthy plants should be removed and placed on the compost heap. All diseased material should be burnt. Where narcissi and tulips have been used for spring bedding and it is desired to replant the beds for a summer display, it will be necessary to remove them after flowering. The bulbs build up their food resources for the next season after flowering, so it is necessary to replant them in a vacant and inconspicuous area for their cycle to be completed. Great care should be taken to see that the roots are not disturbed by the removal of the soil. If the bulbs are transferred in seed boxes, less damage will occur and the brittle foliage of tulips is not so likely to snap at the neck.

Beds which were heavily manured in autumn need be given only a light dusting of superphosphate before planting, whereas beds which have grown a demanding crop such as wallflowers or are to grow a hungry crop such as dahlias should have any available animal manure or compost dug into the top layer of soil. Bedding schemes should be arranged so that plants of geraniums, petunias, or French marigolds do not follow heavy manuring, which tends to give luxuriant leafy growth and fewer flowers.

After being dug, the beds should be firmed and levelled so that they are slightly higher than the grass verge. The shoulder of the bed can be firmed, the head of the rake being used.

When transplanting is to be done the plants should be well soaked the previous day so that they suffer less check when they are moved. When boxed plants are being used the box should be held at an angle of 45 degrees and given a sharp jolt against the ground. This will loosen the rootlets from the box and enable the plants to be taken from the end of the box more easily. The plants should be firmly planted 9in. to 2ft. apart, depending on their habit of growth, and lightly watered to settle them in position.

Planting Chrysanthemums

Toward the end of October the young chrysanthemum plants should be set out 18in. apart in their permanent positions. For these gross feeders the ground after being given a light dressing of lime should be enriched with compost or animal manure. A dusting of the following mixed fertiliser should be given to the bed at 4oz. per square yard:—

Blood and bone, 4 parts by weight
Superphosphate, 2 parts by weight
Sulphate of potash 1 part by weight

The bed can then be lightly watered to settle the plants in place.

A useful combination spray which will keep at bay most of the pests and

GARDEN WORK FOR OCTOBER

Many cacti may be reproduced by taking cuttings at this time.

diseases which attack chrysanthemums and which should be used every 3 weeks until flowering can be made by freshly mixing the following ingredients:—

Lindane emulsion, ½ fl. oz.
Thiram wettable powder, 1¼oz.
Water, 4 gallons

Dividing and Replanting Dahlias

As the risk of late frosts passes, the planting of dahlia tubers should be carried out. Tubers in boxes which have been induced to throw shoots should now be divided. A strong tuber with one or two shoots is all that is required for a good, vigorous plant. Shoots which have developed on old established clumps will benefit from the extra light, air, and nutrients which heavy thinning at this time will produce. Many of the attractive seedling and dwarf dahlias do not require staking, but the taller varieties should be staked at planting.

Roses

The tender young growths which are developing on the rose bushes are very prone to attacks by rust, aphids, black spot, and mildew. Where the roses are growing near white painted woodwork wet sprays of sulphur or ferbam should not be applied. A suitable dust which could be applied to the roses every 3 weeks, with additional applications after heavy rain, can be made using:—

10 parts of 1 or 2 per cent. lindane dust
9 parts of flowers of sulphur
1 part of 50 per cent. thiram or captan

There are now on the market some very effective dusting machines, which simplify the task of keeping roses healthy.

Window Boxes

Window boxes can be used to lend a splash of colour, especially to the kitchen windows and service area of the house. A useful arrangement where metal liners are available is to fill these liners with bulbs and spring-flowering material. At this time of the year the liners can be removed and replaced with a series of pots or another liner containing summer-flowering plants such as ivy-leaved and bedding geraniums, catmint, lobelia, petunias, and asparagus ferns. A loam which is rich in organic matter and coarse sand should be used to assist in retaining moisture throughout summer and also to provide good drainage. A light dressing of blood and bone is desirable.

Throughout summer the main requirement will be constant watering. If potted plants are used, this will be most easily effected by embedding the pots in sawdust, which should be kept moist. A light surface mulch of sawdust will prevent the soil surface from caking due to the pressure of water. Where sawdust is not available the pots can be soaked periodically in a bucket of water to ensure saturation.

Lawns

Vigorous lawn growth is now to be expected and it will be necessary to use a grass catcher when the sward is being cut regularly. If spring top-dressing has been delayed, it should be done now, a mixture of 3 parts by weight of sulphate of ammonia and 1 part of superphosphate being applied at 1oz. per square yard. In addition to stimulating the growth of the finer and more desirable lawn grasses this dressing assists in eradicating many weeds, thus avoiding the use of hormone weedkillers. In the restricted area of a small garden the dangers of spray drift and the contamination of containers make the use of hormones undesirable.

Care of New Lawns

For the first 6 months of their growing life new lawns require special care. When the grass is 1in. to 1½in. tall a light rolling will help to consolidate the soil and encourage the young plants to tiller out into bushy growth. After a few days, when the grass has recovered its erect stature the first cut can be made. The mower must be sharp and set at least ½in. higher than normal, or the plants will be severely damaged. In subsequent cuttings the blade should be gradually lowered.

If the new grass shows signs of a yellow or reddish-brown colouring in the leaves, this will probably indicate that the plants will benefit from a dressing of ½oz. of sulphate of ammonia per square yard, which can be repeated every 2 months for the next 6 months. Lightly hose the fertiliser off the leaves to prevent burning.

General

Continue the planting of gladiolus for summer flowering. The soil round earlier plantings should be lightly forked. Supporting stakes should be inserted where necessary.

Prune the deciduous shrubs after they have flowered to make room for and encourage the growth of young and more vigorous shoots. The *Prunus* spp. generally do not require more than shaping and the removal of damaged or diseased portions. All large wounds should be covered with petroleum jelly to prevent the entry of fungi while the wound is healing.

The staking of perennial plants should keep pace with their growth. Make sure that tall plants like delphiniums and hollyhocks are staked before spring winds damage them.

Many cacti may be reproduced now by taking shoots from any part of the plant and rooting them in small pots. The cuttings should never be inserted deeply in the soil and if support is required, small pieces of bamboo will be satisfactory. If the cut ends exude sap, they should be dipped in powdered charcoal before they are planted.

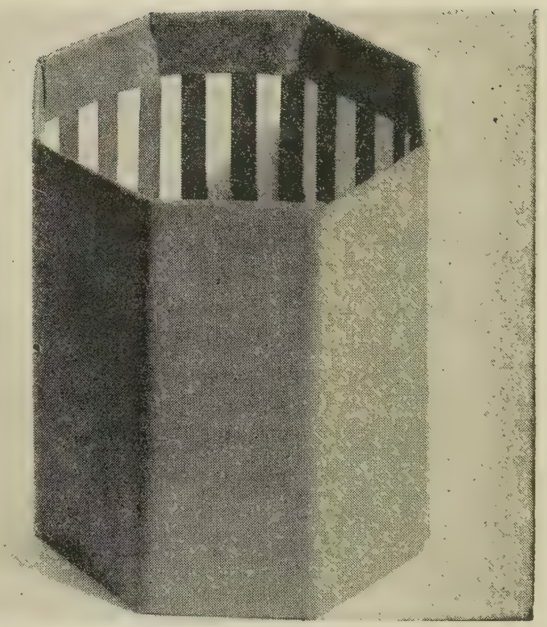
A sharp lookout should be kept for insect pests and fungous diseases, and the appropriate sprays applied immediately.

Folding Waste Basket

By ELEANOR S. CAMPBELL,
Field Officer in Rural Sociology, Department of Agriculture, Auckland

THE small waste basket or "tidy" described and illustrated here is very simply made and can look most attractive. It is very handy in a bedroom or as a receptacle for odd bits and pieces that collect, or it may be a useful travelling companion, for when not in use it may be folded flat to fit snugly into a suitcase.

THIS basket is a novel present for friends and it will have added value for them if they know it has been made by the giver.



The basket ready for use.

Materials Required

Materials required are as follows:—

A piece of **strong** cardboard large enough to cut into eight pieces 7in. x 2½in. and four pieces 1in. x 2½in.; 1 octagonal piece of 6in. diameter, each side being 2½in.

Coverings

Various types of covering may be used.

1. Wall paper, to match that of the room in which the waste basket is to be placed.

2. A firm piece of material which can be glued or pasted on to the cardboard. Too light a material may show marks of the glue or paste, but any reasonably firm material would be satisfactory. One which matches curtains or upholstery will add a pleasant touch.

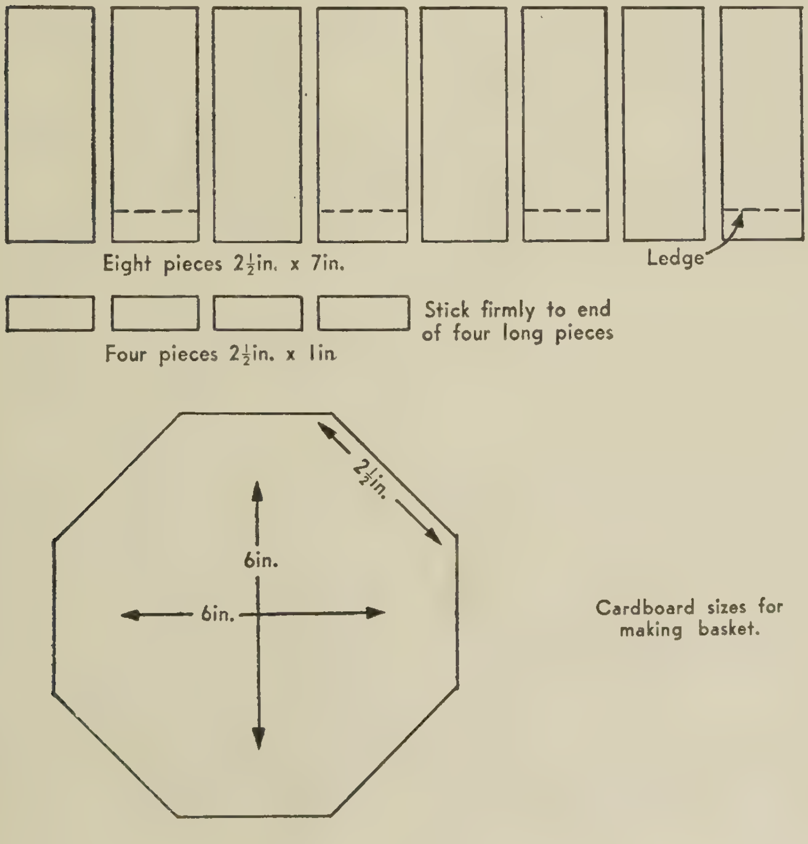
3. Plastic material with adhesive backing is perhaps the easiest form of covering to apply.

Covering Material Needed

If the outside only of the basket is to be covered material required is 1/3yd. of 36in. or ¾yd. of 18in. material or paper.

If the inside and outside are to be covered, material required is ¾yd. of 36in. or 1½yds. of 18in. material or paper.

A neater and more attractively finished article results if both sides are covered.


Eight pieces 2½in. x 7in.
Ledge
Stick firmly to end of four long pieces
Four pieces 2½in. x 1in.
2½in.
6in.
6in.

Cardboard sizes for making basket.

Adhesive

If paper is used, ordinary glue or flour and water paste should be satisfactory. If material is used, a little more care is needed. A good, firm glue can be used, or there is on the market a type of adhesive which is very useful for sticking together various types of materials, upholstery, carpets, mats, etc. If plastic material with an adhesive backing is used, no other adhesive is necessary.

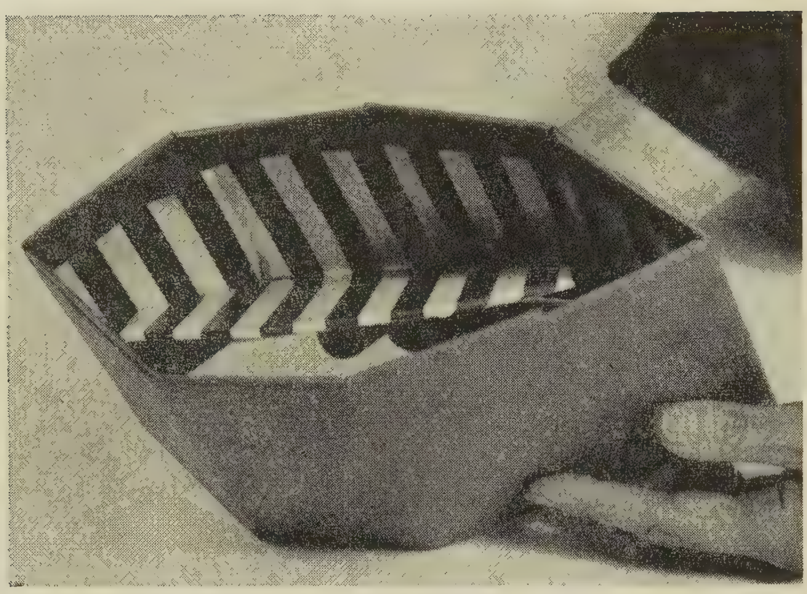
Method

The cardboard must be cut to the required sizes. It is worth while taking a little time in making accurate measurements and clean cuts at this stage, as this will ensure neatly fitting pieces in the finished product.

The octagonal base in particular needs careful attention and accurate measurements.

A good way to cut the cardboard is to place the large piece flat on a wooden table or bench. Measure the pieces carefully and pencil in the outlines. Then place a ruler carefully along the pencilled lines and take **a very sharp** knife, press it down firmly, and draw it along the edge of the ruler. This should cut through the main thickness of the cardboard and taking up the cardboard and bending it back along the cut lines should result in a clean edge.

FOLDING WASTE BASKET



Folding the basket.

Before cutting is attempted care should be taken that the table is well protected, or that the surface is suitable for cutting on.

Once the pieces are cut into the correct shape the next step is to cover them.

For the octagonal base cut a piece of covering material exactly the same shape but about 1in. larger all round.

Place the cardboard base firmly in the centre of the material. If glue or other adhesive is being used, brush it carefully and evenly all over one side of the base and press that side down on to the material. Then, with a pair of scissors, make a neat cut in from the outside corner of each of the eight angles of the covering into the angles of the base. Brush the paste or glue evenly all round the edges of the cardboard base and then turn in neatly and stick down the covering on the top side. Then cut another piece of material or paper exactly fitting the base, apply the paste to the base, and stick the covering neatly but firmly on to it.

If self-adhesive plastic is being used, no glue or paste need be applied; gentle, even pressure of the plastic on to the cardboard will suffice. Care should be taken, however, to press it firmly all over, not allowing any air bubbles or wrinkles to form.

On one end of four of the rectangular pieces of cardboard glue firmly face to face one of the four small (2½in. x 1in.) pieces of cardboard as indicated by the dotted lines on the diagram on page 317. These four small pieces are steps to support the bottom. Be sure these are firmly set before covering. Cut eight strips of the covering material to fit each rectangular piece of cardboard and stick it on firmly and neatly. Crease the covering along the top edge of each step so that it forms a tiny ledge.

The next step is to cut the covering material for the outside of the basket. Cut a long strip of material 9in. or 10in. wide by 22in. long. Brush the glue or paste evenly on the backs of the rectangular strips of cardboard, then place the strips carefully and evenly in a row along the centre of the strip of material or paper. Each alternate strip of cardboard must be one with a little ledge on it.

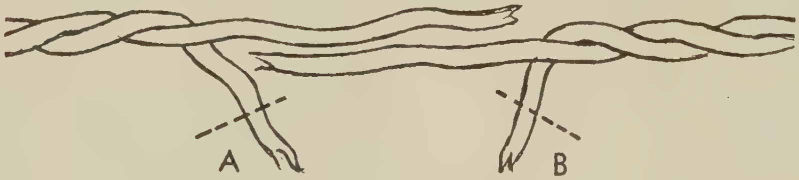
An even amount of covering material should overlap the top and bottom edges of the strips, and these edges should be absolutely even. About 1in. to 2in. of material should extend from the end of the eight strips. If a very slight space is left between each rectangular strip of cardboard, this will ensure more ease in folding.

Pull the material over the top and bottom edges and stick down firmly. Then stand the pieces up and pull the two free ends together so that the whole forms a rectangular tube. Pull the free end of the covering material across neatly and stick it down firmly on to the adjoining strip. This should make a neat and invisible join.

Next push down the base into the centre so that it rests on the four little ledges already prepared. Cut a strip of the covering material, about 2½in. x 4in., to form a hinge. Stick one half firmly on to the inside of the basket, attaching the other end equally firmly to the base. This forms the hinge for folding the base.

To fold up the basket simply push up the base from the bottom and press the basket out flat.

Photographs by Sparrow.



Joining a Skein of Wool

THE reverse side of a hand-knitted garment is not always as neat as it might be because of protruding ends where a new skein of wool has been started. This method will not only get rid of the ends, but will avoid also those few, thickened stitches where the end of the old skein and the beginning of the new one have been knitted together.

For the last 3in. to 4in. at the end of the skein and a similar length at the beginning of the new skein split the wool into two strands. Break off one strand of each (A and B), then place the remaining strands alongside each other (as shown in diagram above), and roll them together between the hands. A continuous thread is formed which can be knitted without leaving any trace of the join.

—MAUD B. STRAIN, Field Officer in Rural Sociology,
Department of Agriculture, Dunedin

Child's Seamless Classic Cardigan

NO fancy stitches are required for the child's warm and comfortable cardigan instructions for making which are given here, but the finished garment is very attractive and is unusual in that it is seamless. Instructions for three sizes—28in. chest, 30in. chest, and 32in. chest—are given.

ABBREVIATIONS: K., knit; p., purl; st., stitch(es); rep., repeat; cont., continue; st.st., stocking stitch; tog., together; dec., decreas(ing); sl., slip; p.s.s.o., pass slipped st. over.

Materials: 7oz. of 3-ply wool; 2 No. 11 and 2 No. 13 knitting needles; 4 No. 11 and 4 No. 13 knitting needles for sleeves; 3 short No. 13 needles for front borders, and 6 buttons.

Measurements: Length, 19½in.; chest, 30in.; sleeve seam, 15in. (adjustable).

Tension: 8 st. to 1in.

28in. chest: As in pattern but on No. 12 needles with all ribbing on No. 13 needles. Length: 19in. Tension: 8½ st. to 1in. Sleeves: As in pattern (adjustable).

30in. chest: As in pattern. Length: 19½in.

32in. chest: As in pattern but on No. 10 needles with all ribbing on No. 13 needles. Length: 20in. Tension: 7½ st. to 1in. Sleeves: As in pattern (adjustable).

Pocket Linings

Using two No. 13 needles cast on 30 st. and work in k. 1, p. 1 rib for 4in. Leave stitches on a spare needle. Work another piece in same way.

The Cardigan

Now begin at lower edge, using two No. 13 needles and cast on 255 st.

1st row: * K. 1, p. 1. Rep. from * to last st., k. 1.

2nd row: * P. 1, k. 1. Rep. from * to last st., p. 1.

Rep. these 2 rows for ½in., ending with a 2nd row of rib if buttonholes are to be in right front or 1st row of rib if buttonholes are to be in left front.

Next row: Rib 5, cast off 3 st., rib to end.

Next row: Rib to last 5 st., cast on 3, rib 5. (This completes a buttonhole.)

Cont. in rib, working 2 more buttonholes at intervals of 1½in. from previous one, until work measures 4in., ending with a 2nd row of rib.

Next row: Rib 28, cast off 30, rib to last 59 st., cast off 30, rib to end.

Next row: Rib 29, work in rib across stitches for a pocket lining, rib to last 28 st., work in rib across stitches for a second pocket lining, rib to end.

Next row: Rib 14, change to a No. 11 needle, k. 2 tog., k. to last 14 st., change to a short No. 13 needle, rib to end. (254 st.)

Next row: Rib 14, change to a No. 11 needle, p. to last 14 st., change to a No. 13 needle, rib to end.

Keeping 14 st. at each end of row in rib on No. 13 needles throughout, cont. in st.st. with No. 11 needles for main part until work measures 12in. from cast-on edge, ending with a p. row and making 3 more buttonholes in right front border at regular intervals of 2¾in. (instead of 1½in. measured over st.st.).

Shaping the Fronts

Next row: Rib 14, k. 2 tog., k. to last 16 st., k. 2 tog., rib 14. Work 8 rows in rib and st.st.

Next row: Rib 14, p. 2 tog., p. to last 16 st., p. 2 tog., rib 14.

Next row: Rib 14, k. 43, turn, work on these stitches only for right front, leaving other stitches on a spare needle.

Cont. in st.st. and rib, dec. 1 st. inside front ribbing on 8th row and on every following 9th row until 50 st. remain, then cont. without shaping until work measures 19½in. from cast-on edge, ending at front edge.

Next row: Rib 14, turn, work a further 2in. in rib on these 14 st. Leave all stitches on a spare needle.

Return to main stitches, slip first 16 st. on to a safety pin, rejoin wool, k. 104 st., turn.

Work in st.st. on these stitches for back until work measures 19½in., ending with a p. row.

CHILD'S CARDIGAN . . .

Next row: K. 36, cast off 32, k. to end. Leave two sets of 36 st. on a spare needle. Return to remaining stitches, slip next 16 st. on to a second safety pin, rejoin wool, and using No. 11 needles k. to last 14 st., rib 14 with a No. 13 needle.

Now work on these stitches for left front as given for right front. Place corresponding shoulder stitches and neck-band stitches tog. and graft.

The Sleeves

Using 4 No. 11 needles and with right side of work facing slip 16 st. at under-arm on to 1 needle, then k. up 96 st. evenly round armhole edge (48 st. each side of shoulder seam), then k. 8 st. for under-arm on to 3rd needle, thus making centre of under-arm stitches end of round.

1st round: K. 7, k. 2 tog., k. 61, turn.
2nd row: P. 28, turn.
3rd row: K. 32, turn.
4th row: P. 36, turn.

Cont. in this way, taking up 4 st. more on every row until 14 rows of shaping have been worked, the last row being p. 76, turn.

Next row: K. these 76 st., then k. 9, sl. 1, k. 1, p.s.s.o., k. 7.

Cont. in rounds, shaping under-arm gusset thus:—

1st round: K. 6, k. 2 tog., k. to last 8 st., sl. 1, k. 1, p.s.s.o., k. 6.

2nd round: K. 5, k. 2 tog., k. to last 7 st., sl. 1, k. 1, p.s.s.o., k. 5.

3rd round: K. 4, k. 2 tog., k. to last 6 st., sl. 1, k. 1, p.s.s.o., k. 4.

4th round: K. 3, k. 2 tog., k. to last 5 st., sl. 1, k. 1, p.s.s.o., k. 3.

Cont. thus, working 1 st. less at each end of round between shaping until all under-arm stitches are dec., last round being: K. 2 tog., k. to last 2 st., sl. 1, k. 1, p.s.s.o.

Cont. in rounds of st.st., dec. 1 st. at beginning and end of every following 7th round until 62 st. remain. Cont. without shaping until work measures 12in. from end of under-arm gusset shaping, finishing end of round.

Change to No. 13 needles and work in rounds of k. 1, p. 1 rib for 3in. Cast off loosely in rib.

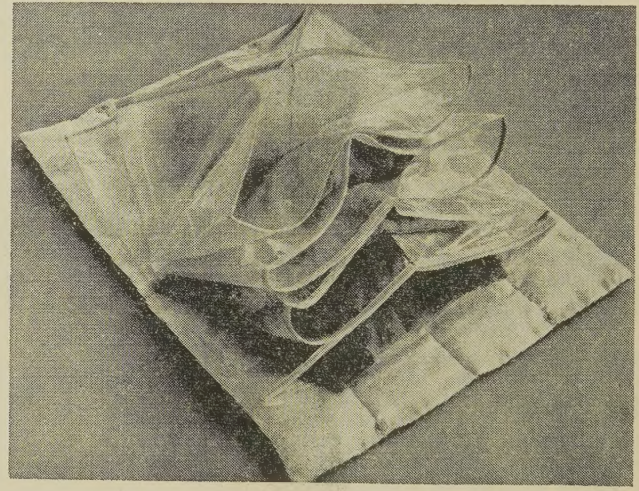
To Make up

Press work lightly with a hot iron over a damp cloth. Sew neck band along back of neck edge. Sew pocket linings on wrong side of work. Sew on buttons to match with buttonholes.

Stocking Holder with Six Compartments

THE stocking holder illustrated may be made easily from plastic film, cottonwool, and waste scraps of fabric.

The materials required are two pieces of fabric, each 15in. x 10½in., for the cover; cottonwool; plastic film about 60in. x 12in.; and 2 dome fasteners.



[*Sparrow*

To Make up

The cover: Sew the two pieces of fabric together as in Fig. 1, allowing ½in. seams. Turn inside out and press flat. Fill with a layer of cottonwool, close the opening with neat stitches, and secure the cottonwool in place with lines of machine stitching as shown in the illustration at upper right.

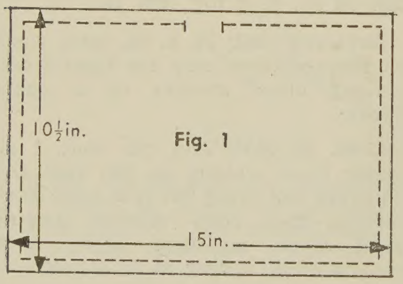


Fig. 1

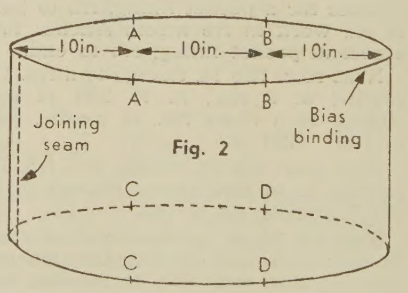


Fig. 2

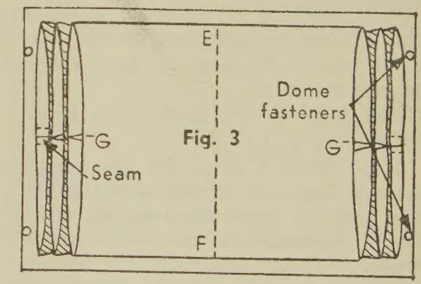


Fig. 3

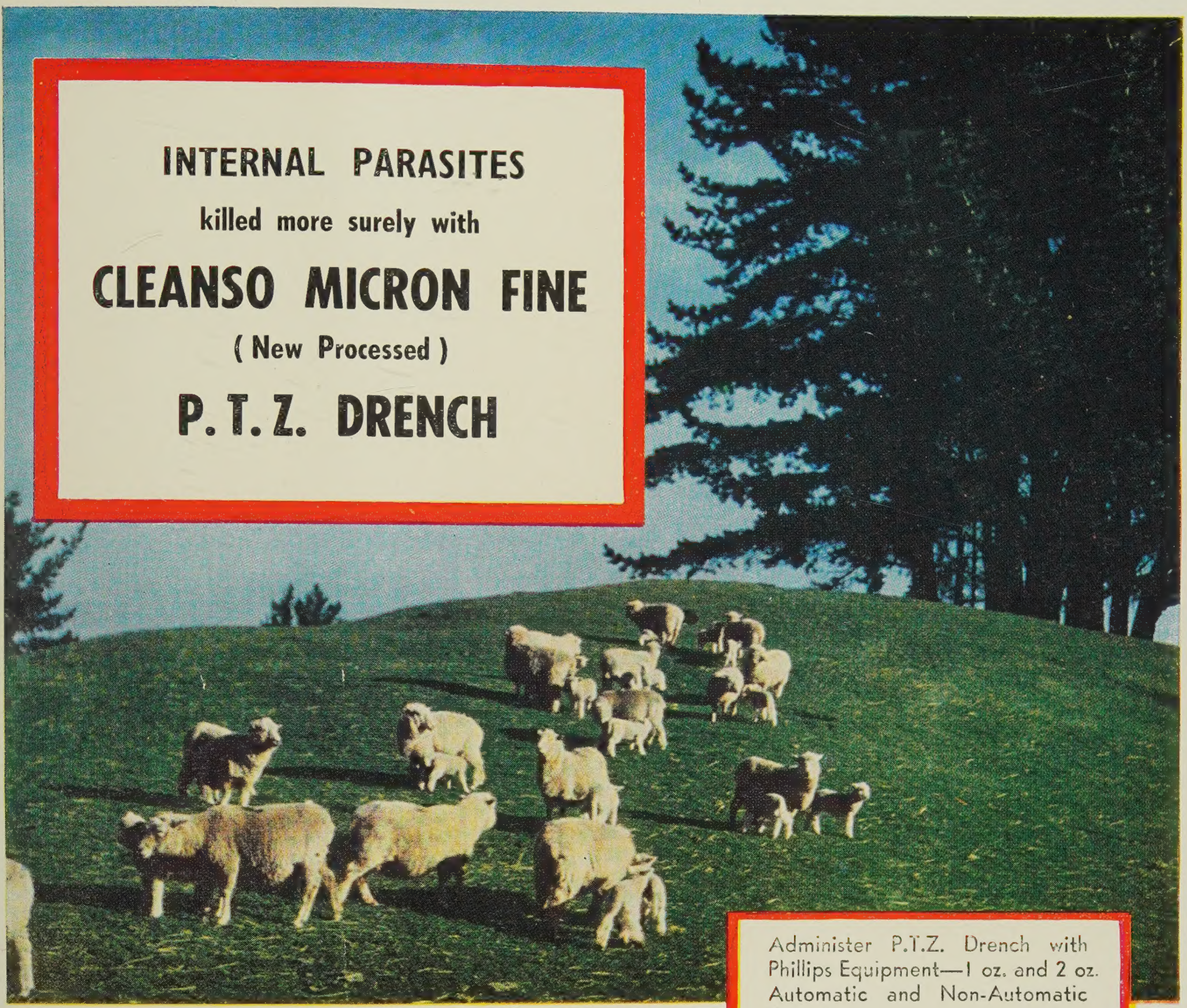
The plastic holder: Sew the two 12in. sides of the plastic film together and bind the long sides with bias binding as in Fig. 2. Mark the long sides into 10in. spaces from the joining seam (Fig. 2) and with a few overcasting stitches join A to A, B to B, C to C, and D to D. Fold the plastic film as in Fig. 3 and place on the prepared cover.

Attach the cover to the holder with a line of stitching EF as in Fig. 3. Join G to G with a few overcasting stitches and sew on dome fasteners as indicated.

—*MOLLY MACPHERSON,*

formerly Field Officer in Rural Sociology, Department of Agriculture, Auckland

Printed by Blundell Bros. Ltd. (The Evening Post), Wellington—5934



INTERNAL PARASITES
killed more surely with
CLEANSO MICRON FINE
(New Processed)
P. T. Z. DRENCH

Administer P.T.Z. Drench with Phillips Equipment—1 oz. and 2 oz. Automatic and Non-Automatic Drenchers.

AVAILABLE IN LIQUID (NEW PROCESSED) OR TABLET FORM

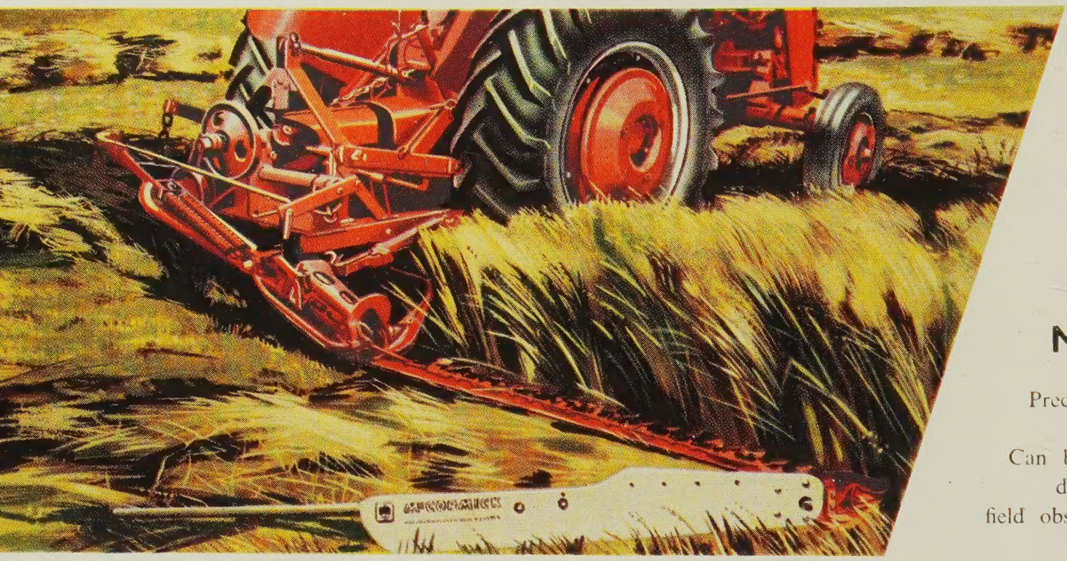
A quality flock needs a quality drench. Buy Cleanso micron fine P.T.Z.—use this much improved, smooth running drench with confidence. THERE IS NO FINER PRODUCT.

CHALLENGE
ESTABLISHED

NEW ZEALAND DISTRIBUTORS: **Wright Stephenson**
& COMPANY . LTD

AVAILABLE FROM ALL BRANCHES

GET READY for haymakin

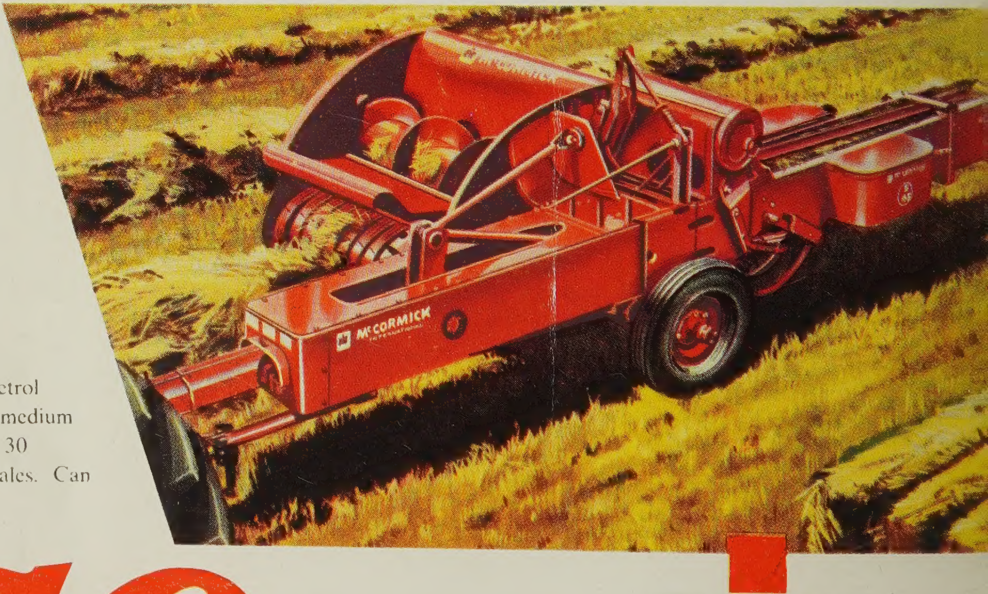


B-23

3 POINT
MOUNTED MOWE

Precision-built cutter-bars cut cleaner
longer. Width of cut: 5 ft. or 6 ft.
Can be used on any 3-point tractor. Sa
devices fitted to prevent damage from
field obstructions. Complete tractor seat con

GET SET with good implemen



B-45

HAY OR SILAGE
BALER

P.T.O. or engined-functioned—Petrol or Diesel. Can be used with any medium powered tractor. Bales in lengths of 30 and 36 inches. Bales silage in half bales. Can be used as stationary baler.

GO WITH IH

Literature available on application.

INTERNATIONAL HARVESTER

H 709

INTERNATIONAL HARVESTER COMPANY OF N.Z. LTD.—Branches and Dealers Throughout New Zeal